



# GHADIALI

## General Surgery

P R E S E N T S

Dr. Mufa T. Ghadiali is skilled in all aspects of General Surgery.  
His General Surgery Services include:

- General Surgery
- Advanced Laparoscopic Surgery
- Surgical Oncology
- Gastrointestinal Surgery
- Hernia Surgery
- Endoscopy

### Kidney Stones

Multimedia Health Education

#### ***Disclaimer***

This movie is an educational resource only and should not be used to manage your health. All decisions about the management of Kidney Stones must be made in conjunction with your Physician or a licensed healthcare provider.

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### MULTIMEDIA HEALTH EDUCATION MANUAL

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### INTRODUCTION

Kidney stones, one of the most painful of the urologic disorders, are one of the most common disorders of the urinary tract. Most kidney stones pass out of the body without any intervention by a physician. Stones that cause lasting symptoms or other complications may be treated by various techniques, most of which do not involve major surgery. To learn more about kidney stones, it helps to understand the normal anatomy of the urinary tract.

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#### Unit 1:

#### Normal Anatomy

##### Normal Urinary Tract Anatomy

Your kidneys are bean-shaped organs, each about the size of your fist. They are located near the middle of your back, just below the rib cage, one on each side of the spine. The kidneys are sophisticated trash collectors. Every day, your kidneys process about 200 quarts of blood to sift out about 2 quarts of waste products and extra water. The wastes and extra water become urine, which flows to your bladder through tubes called ureters. Your bladder stores urine until you go to the bathroom.

The wastes in your blood come from the normal breakdown of active muscle and from the food you eat. Your body uses the food for energy and self-repairs. After your body has taken what it needs from the food, wastes are sent to the blood. If your kidneys did not remove these wastes, they would build up in the blood and damage your body.

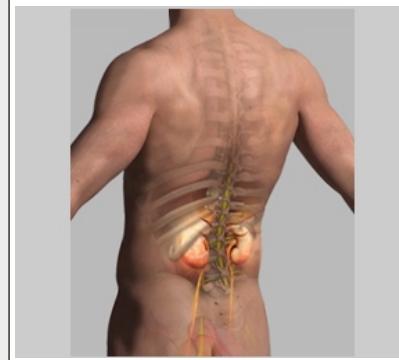
In addition to removing wastes, your kidneys help control blood pressure. They also help make red blood cells and keep your bones strong.

##### Kidneys

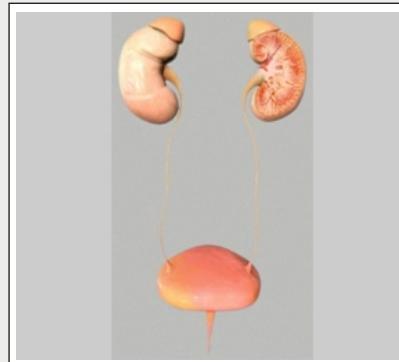
(Refer fig.3)

##### Bladder

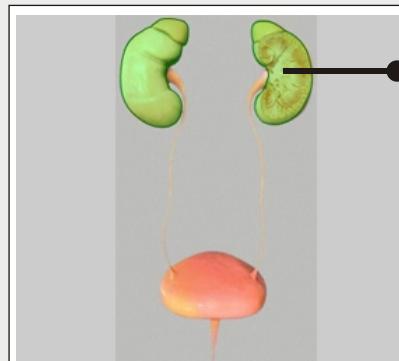
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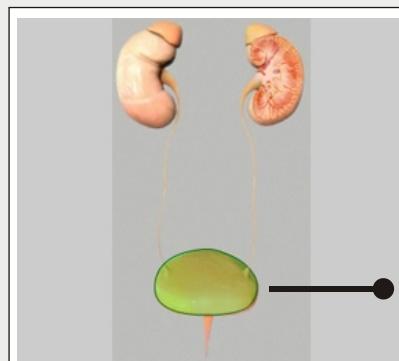
(Fig.1)



(Fig.2)



Kidneys



Bladder

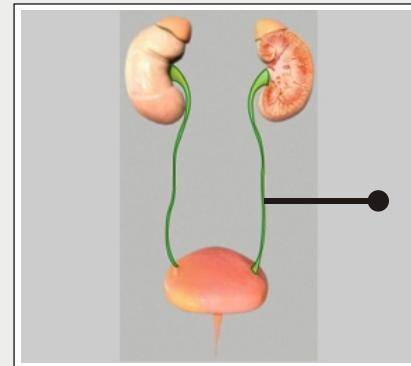
(Fig.5)

#### Unit 1:

#### Normal Anatomy

##### Ureters

(Refer fig.6)

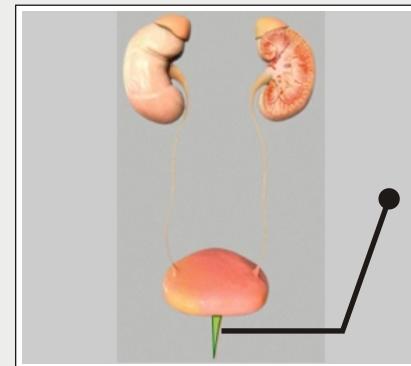


**Ureters**

(Fig.6)

##### Urethra

(Refer fig.7)



**Urethra**

(Fig.7)

#### Unit 2:

#### Overview of Kidney Stones

##### What is a Kidney Stone?

A kidney stone is a solid piece of material that forms in a kidney out of substances in the urine. A stone may stay in the kidney or break loose and travel down the urinary tract.

A small stone may pass all the way out of the body without causing too much pain. A larger stone may get stuck in a ureter, the bladder, or the urethra. A problem stone can block the flow of urine and cause great pain.

(Refer fig.8)

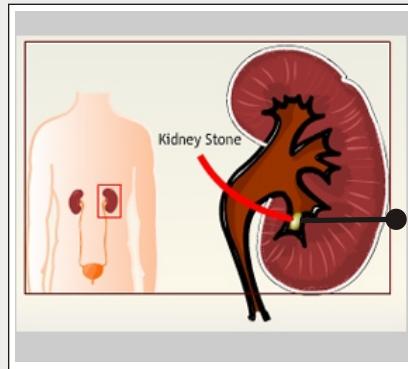
##### Types of Kidney Stones

Kidney stones may be as small as a grain of sand or as large as a pearl. Some stones are even as big as golf balls. Stones may be smooth or jagged. They are usually yellow or brown. Doctors have found four major types of kidney stones.

- The most common type of stone contains calcium. Calcium is a normal part of a healthy diet. Calcium that is not used by the bones and muscles goes to the kidneys. In most people, the kidneys flush out the extra calcium with the rest of the urine. People who have calcium stones keep the calcium in their kidneys. The calcium that stays behind joins with other waste products to form a stone. The most common combination is called calcium oxalate.
- A struvite stone may form after an infection in the urinary system. These stones contain the mineral magnesium and the waste product ammonia.
- A uric acid stone may form when the urine contains too much acid. If you tend to form uric acid stones, you may need to cut back on the amount of meat you eat.
- Cystine stones are rare. Cystine is one of the building blocks that make up muscles, nerves, and other parts of the body. Cystine can build up in the urine to form a stone. The disease that causes cystine stones runs in families.

##### Symptoms of Kidney Stones

Kidney stones often do not cause any symptoms. If symptoms do occur, the first symptom of a kidney stone is extreme pain, which begins suddenly when a stone moves in the urinary tract and blocks the flow of urine. Typically, a person feels a sharp, cramping pain in the back and side in the area of the kidney or in the lower abdomen. Sometimes nausea and vomiting occur. Later, pain may spread to the groin.



**Kidney Stone**

**(Fig.8)**

### Symptoms of Kidney Stones

If the stone is too large to pass easily, pain continues as the muscles in the wall of the narrow ureter try to squeeze the stone into the bladder. As the stone moves and the body try to push it out, blood may appear in the urine, making the urine pink. As the stone moves down the ureter, closer to the bladder, a person may feel the need to urinate more often or feel a burning sensation during Urination.

You should call a doctor if you have any of the following signs: These may be signs of a kidney stone that needs a doctor's care.

Extreme pain in your back or side that will not go away

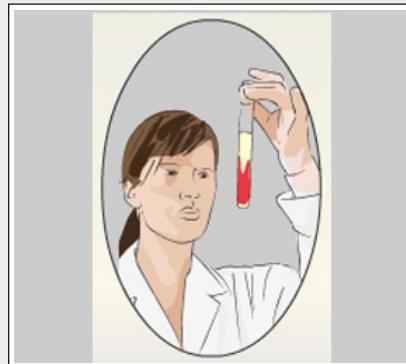
(Refer fig.9)



(Fig.9)

Blood in your urine

(Refer fig.10)



(Fig.10)

Fever and chills

(Refer fig.11)



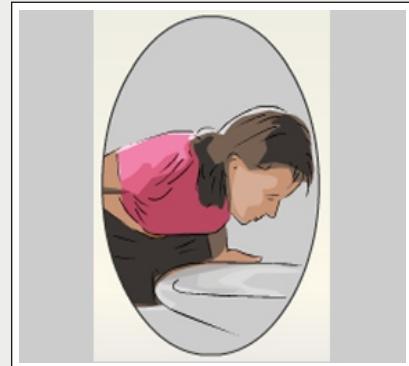
(Fig.11)

#### Unit 2:

#### Overview of Kidney Stones

##### Vomiting

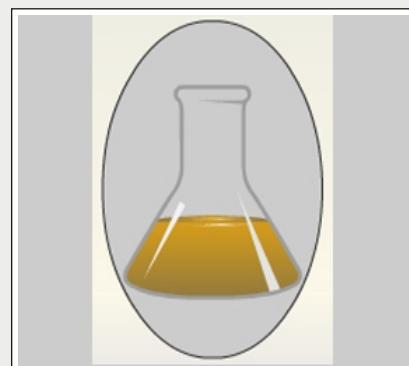
(Refer fig.12)



(Fig.12)

##### Urine that smells bad or looks cloudy

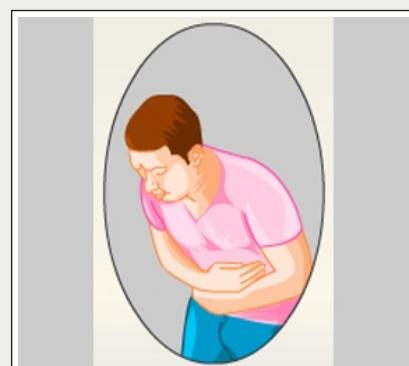
(Refer fig.13)



(Fig.13)

##### A burning feeling when you urinate

(Refer fig.14)



(Fig.14)

#### Causes

Stones occur more frequently in men. The prevalence of kidney stones rises dramatically as men enter their 40s and continues to rise into their 70s. For women, the prevalence of kidney stones peaks in their 50s. Once a person gets more than one stone, other stones are likely to develop.

Doctors do not always know what causes a stone to form. While certain foods may promote stone formation in people who are susceptible, scientists do not believe that eating any specific food causes stones to form in people who are not susceptible.

#### Unit 2:

#### Overview of Kidney Stones

A person with a family history of kidney stones may be more likely to develop stones. Urinary tract infections, kidney disorders such as cystic kidney diseases, and certain metabolic disorders such as hyperparathyroidism are also linked to stone formation.

You are more likely to get a kidney stone if

You are Caucasian

(Refer fig.15)



(Fig.15)

You are male

(Refer fig.16)



(Fig.16)

You are 40 or older

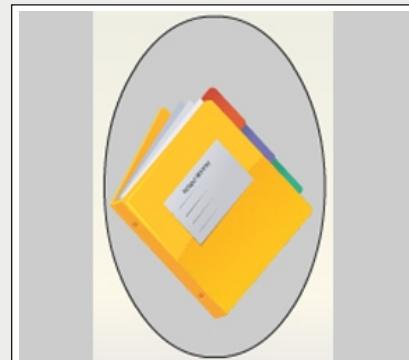
(Refer fig.17)



(Fig.17)

You have had a kidney stone before

(Refer fig.18)



(Fig.18)

### Kidney Stone Prevention

Try to drink 12 full glasses of water a day. Drinking lots of water helps to flush away the substances that form stones in the kidneys. You can also drink ginger ale, lemon-lime sodas, and fruit juices. But water is best. Limit your coffee, tea, and cola to 1 or 2 cups a day because the caffeine may cause you to lose fluid too quickly.

Your doctor may ask you to eat more of some foods and to cut back on other foods. For example, if you have a uric acid stone, your doctor may ask you to eat less meat, because meat breaks down to make uric acid. If you are prone to forming calcium oxalate stones, you may need to limit foods that are high in oxalate. These foods include rhubarb, beets, spinach, and chocolate.

The doctor may give you medicines to prevent calcium and uric acid stones. The therapy your doctor gives you depends on the type of stone you have. For example, a medicine that helps prevent calcium stones will not work if you have a struvite stone. The diet changes that help prevent uric acid stones may not work to prevent calcium stones. Therefore, careful analysis of the stone will help guide your treatment.

#### Unit 3:

#### Treatment Options

##### Diagnosis

Sometimes “silent” stones—those that do not cause symptoms—are found on x rays taken during a general health exam. If the stones are small, they will often pass out of the body unnoticed.

Often, kidney stones are found on an x ray or ultrasound taken of someone who complains of blood in the urine or sudden pain. These diagnostic images give the doctor valuable information about the stone’s size and location. Blood and urine tests help detect any abnormal substance that might promote stone formation.

The doctor may decide to scan the urinary system using a special test called a computerized tomography (CT) scan or an intravenous pyelogram (IVP). The results of all these tests help determine the proper treatment.

##### Conservative Treatment

Conservative treatment options for kidney stones include:

**Hydration:** Drinking fluids can help to flush small stones out of the urinary tract.

(Refer fig.19)



Hydration

(Fig.19)

**Medication:** Your doctor may prescribe medication depending on the type of kidney stone or if infection is present. Pain medications may also be prescribed.

(Refer fig.20)



Medication

(Fig.20)

#### Unit 3:

#### Treatment Options

**Diet:** Dietary changes may be suggested by your doctor depending on the type of kidney stone present.

(Refer fig.21)



(Fig.21)

### Surgical Overview

Surgery may be needed to remove a kidney stone if it

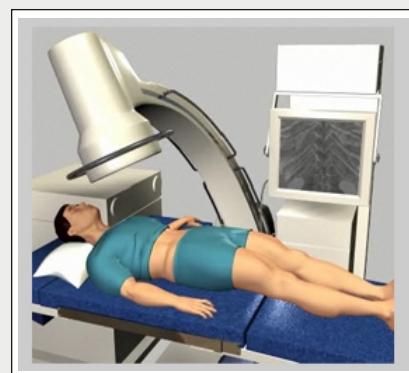
- does not pass after a reasonable period of time and causes constant pain
- is too large to pass on its own or is caught in a difficult place
- blocks the flow of urine
- causes an ongoing urinary tract infection
- damages kidney tissue or causes constant bleeding
- has grown larger, as seen on follow-up x rays

Until 20 years ago, open surgery was necessary to remove a stone. The surgery required a recovery time of 4 to 6 weeks. Today, treatment for these stones is greatly improved, and many options do not require major open surgery and can be performed in an outpatient setting.

### Surgical Treatment

**Extracorporeal Shock Wave Lithotripsy**  
Extracorporeal shock wave lithotripsy (ESWL) is the most frequently used procedure for the treatment of kidney stones. It is usually performed on an outpatient basis with the patient under IV sedation or general anesthesia.

(Refer fig.22)



(Fig.22)

#### Unit 3:

#### Treatment Options

##### Surgical Treatment

In ESWL, shock waves that are created outside the body travel through the skin and body tissues until they hit the denser stones. The stones break down into small particles and are easily passed through the urinary tract in the urine. Most ESWL devices use either x rays or ultrasound to help the surgeon pinpoint the stone during treatment.

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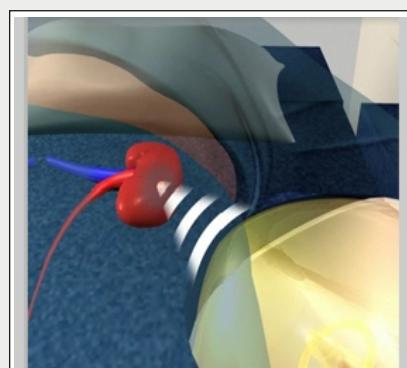
(Refer fig.23 & 25)



(Fig.23)



(Fig.24)



(Fig.25)

##### Ureteroscopic Stone Removal:

Although some stones in the ureters can be treated with ESWL, ureteroscopy may be needed for mid- and lower-ureter stones. This procedure is usually performed on an outpatient basis with the patient under general anesthesia.

(Refer fig. 26 to 29)



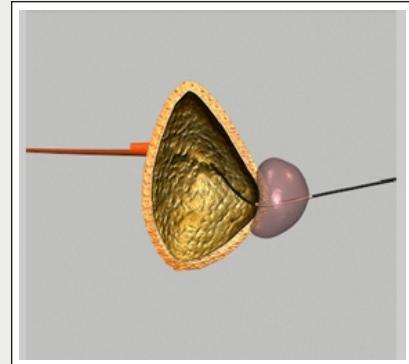
(Fig.26)

#### Unit 3:

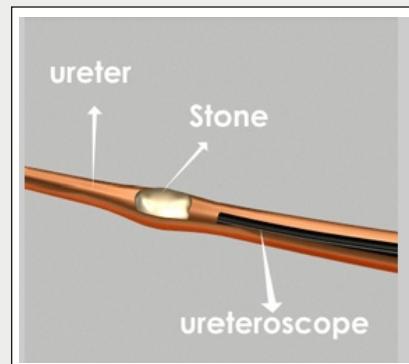
#### Treatment Options

No incision is made in this procedure. Instead, the surgeon passes a small fiberoptic instrument called a ureteroscope through the urethra and bladder into the ureter. The surgeon then locates the stone and either removes it with a cage-like device or shatters it with a special instrument that produces a form of shock wave. A small tube or stent may be left in the ureter for a few days to help urine flow.

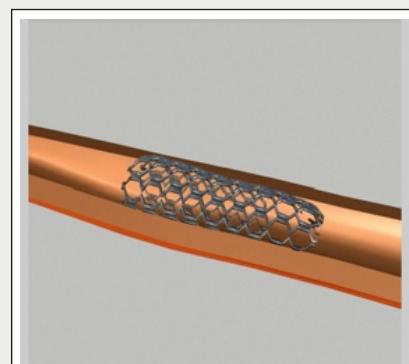
(Refer fig. 26 to 29)



(Fig.27)



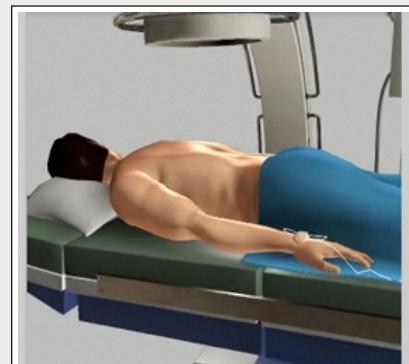
(Fig.28)



(Fig.29)

**Percutaneous Nephrolithotomy or Tunnel Surgery:**  
This surgery requires a hospital stay and is performed with the patient under general anesthesia. In Tunnel surgery, the surgeon makes a tiny incision in the back and creates a tunnel directly into the kidney.

(Refer fig. 30 & 31)



(Fig.30)

#### Unit 3:

#### Treatment Options

Using an instrument called a nephroscope, the surgeon locates and removes the stone. For large stones, some type of energy probe—ultrasonic or electrohydraulic—may be needed to break the stone into small pieces.

(Refer fig. 30 & 31)

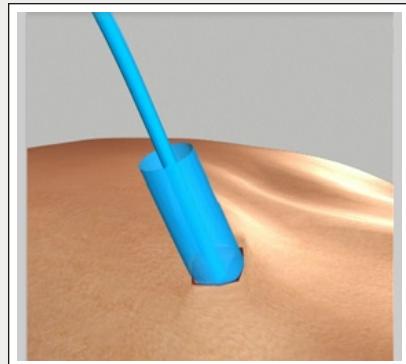
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(Refer fig. 32 & 34)

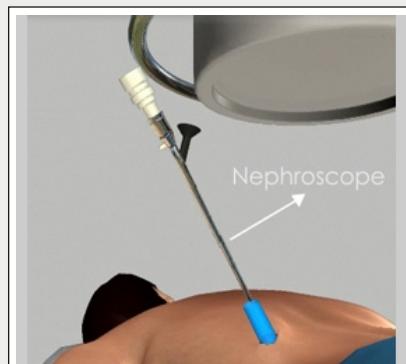
Often, patients stay in the hospital for several days and may have a small tube called a nephrostomy tube left in the kidney during the healing process. This treatment is often used when the stone is quite large or in a location that does not allow effective use of ESWL.

One advantage of percutaneous nephrolithotomy is that the surgeon can remove some of the stone fragments directly instead of relying solely on their natural passage from the kidney.

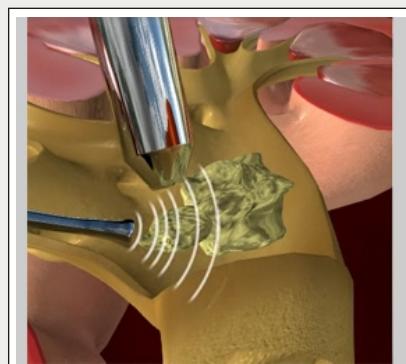
(Refer fig. 32 & 34)



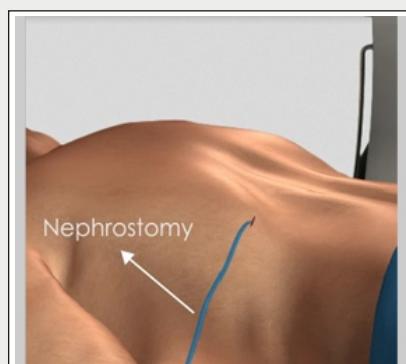
(Fig.31)



(Fig.32)



(Fig.33)



(Fig.34)

#### Unit 3:

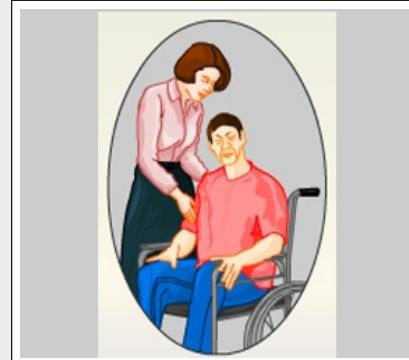
#### Treatment Options

##### Post Operative Precautions

Your surgeon will give you guidelines to follow depending on the type of procedure performed. General guidelines include the following:

If your surgery was performed as outpatient surgery, you will require a driver to take you home due to the drowsy effects of anaesthesia.

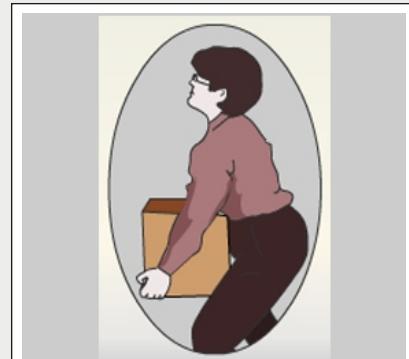
(Refer fig. 35)



(Fig.35)

Your surgeon may give you activity restrictions such as no heavy lifting and when you can return to work. It is very important that you follow your surgeon's instructions for a successful recovery.

(Refer fig. 36)



(Fig.36)

You may feel soreness around the incision area. Your surgeon may give you a prescription pain medicine or recommend NSAID's (non-steroidal anti-inflammatory drugs) for the first few days to keep you comfortable.

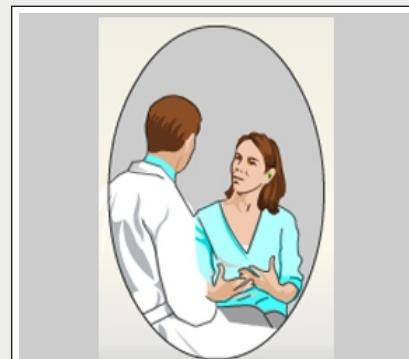
(Refer fig. 37)



(Fig.37)

Contact your doctor immediately if you have a fever, chills, increased pain, bleeding or fluid leakage from the incision, chest pain and shortness of breath, leg pain, or dizziness.

(Refer fig. 38)



(Fig.38)

#### Unit 3:

#### Treatment Options

### Risks and Complications

As with any surgery there are potential risks involved. The decision to proceed with the surgery is made because the advantages of surgery outweigh the potential disadvantages. It is important that you are informed of these risks before the surgery takes place.

Most patients do not have complications after Kidney Stone surgery; however complications can occur and depend on which type of surgery your doctor performs as well as the patient's health status. (Obese, diabetic, smoker, etc.)

Complications can be medical (general) or specific to your surgery. Medical complications include those of the anesthesia and your general well being.

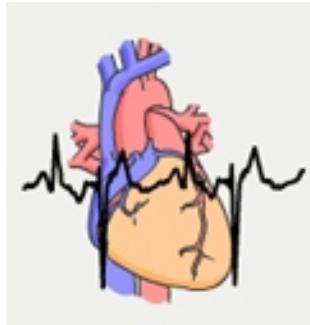
Almost any medical condition can occur so this list is not complete. Complications include:



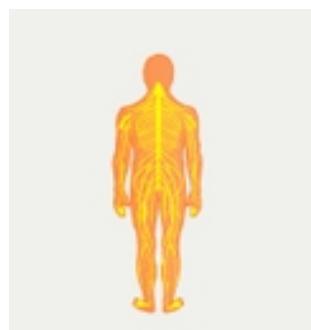
Allergic reactions to medications



Blood loss requiring transfusion with its low risk of disease transmission



Heart attacks, strokes, kidney failure, pneumonia, bladder infections



Complications from nerve blocks such as infection or nerve damage

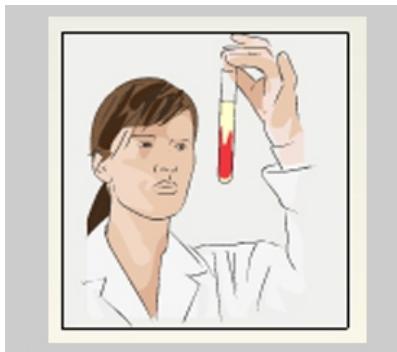


Serious medical problems can lead to ongoing health concerns, prolonged hospitalization, or rarely death.

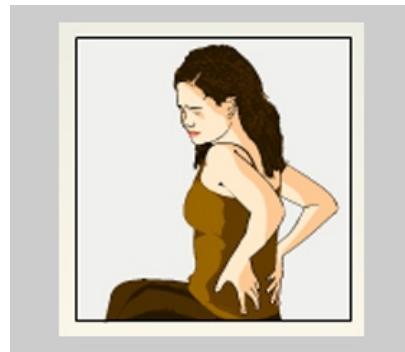
#### Unit 3:

#### Treatment Options

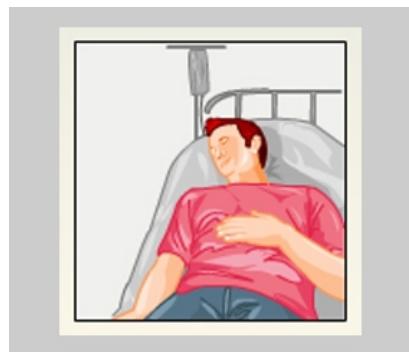
Specific Complications of ESWL can include:



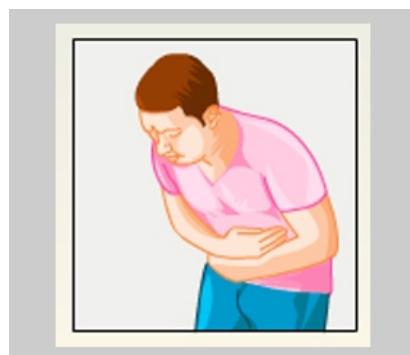
Blood in the urine which usually resolves in a few days



Bruising and minor discomfort in the back or abdomen



Additional treatments may be needed if stone still present



Pain while passing the stone particles

Specific Complications of Ureteroscopy can include:

- Urinary Infection
- Bleeding
- Damage to the ureter

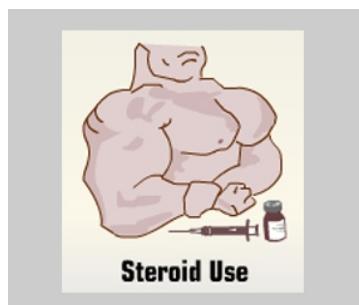
Specific Complications of Percutaneous Nephrolithotomy or Tunnel surgery include:

- Infection
- Bleeding
- Urinary fistulas
- Perforation of adjacent

#### Unit 3:

#### Treatment Options

Risk factors that can negatively affect adequate healing after surgery include:



### Unit 3:

### Disclaimer

#### Disclaimer

Although every effort is made to educate you on Kidney Stones and take control, there will be specific information that will not be discussed. Talk to your doctor or health care provider about any concerns you have about Kidney Stones.



### YOUR SURGERY DATE



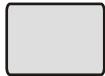
**READ YOUR BOOK AND MATERIAL**



**VIEW YOUR VIDEO /CD / DVD / WEBSITE**



**PRE - HABILITATION**



**ARRANGE FOR BLOOD**



**MEDICAL CHECK UP**



**ADVANCE MEDICAL DIRECTIVE**



**PRE - ADMISSION TESTING**



**FAMILY SUPPORT REVIEW**

**Physician's Name :** \_\_\_\_\_

**Patient's Name :** \_\_\_\_\_

**Physician's Signature:** \_\_\_\_\_

**Patient's Signature:** \_\_\_\_\_

**Date :** \_\_\_\_\_

**Date :** \_\_\_\_\_