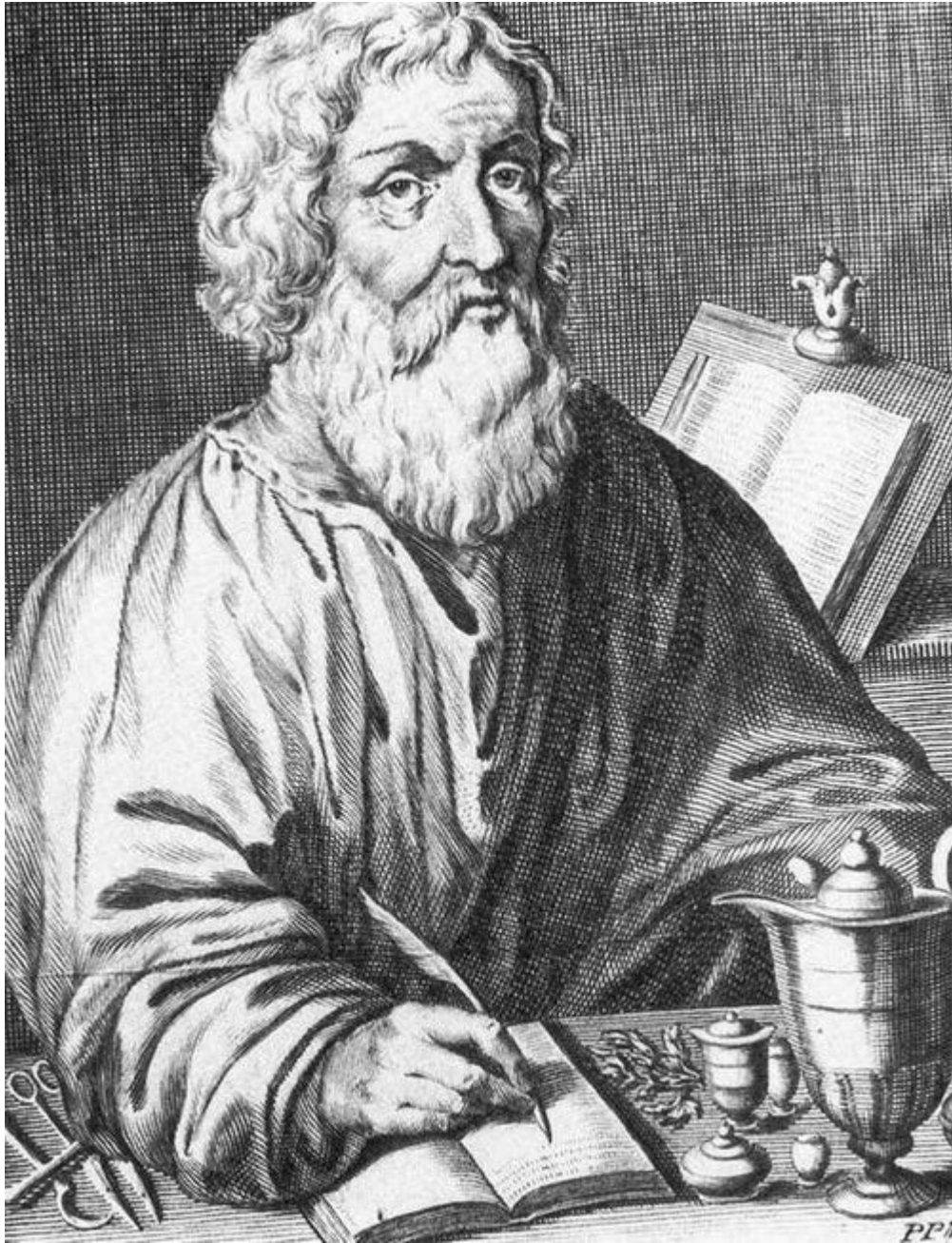


# Urinary Stone Disease

**Stephen Mitchell MA MB FRCS (Urol) PhD**  
**Clinical Lead, Division of General Surgery and**  
**Urology, Barnsley Hospital NHS Foundation**  
**Trust**

# History





**“I will not use the knife, not even on sufferers from stone, but will withdraw in favour of such men as are engaged in this work.”**

**(Hippocrates, 460 – c.370BC)**

# The Lithotomists



**Frère Jacques Beaulieu  
(French 1651 – 1720)**



**Jan de Doot (17<sup>th</sup> Century Dutch  
blacksmith... and urologist)**

# Scope of Talk

- **Epidemiology**
- **Pathophysiology**
- **Renal Stones**
- **Ureteric Stones**
- **Primary Care Management**
- **What's New?**

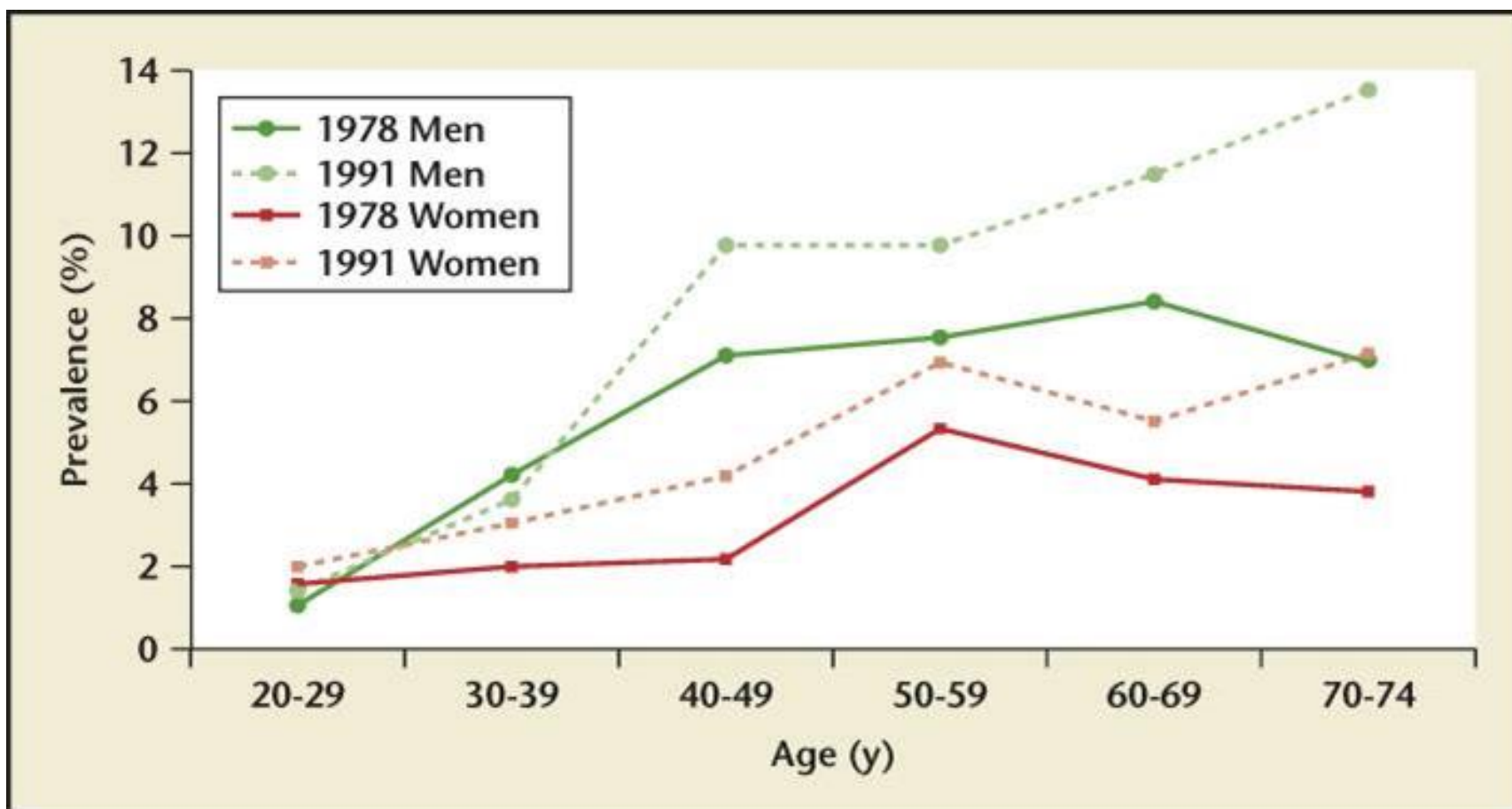
# Epidemiology

# Renal Stones

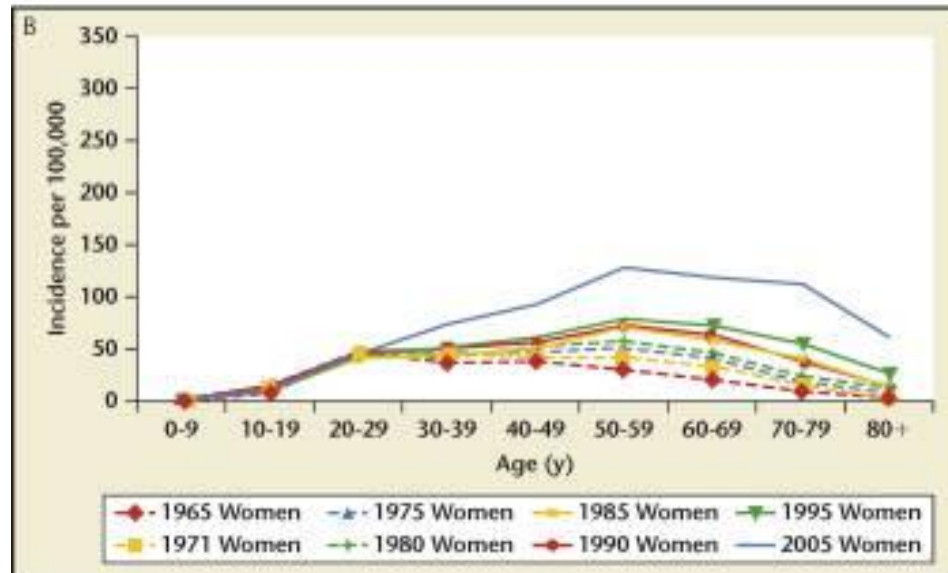
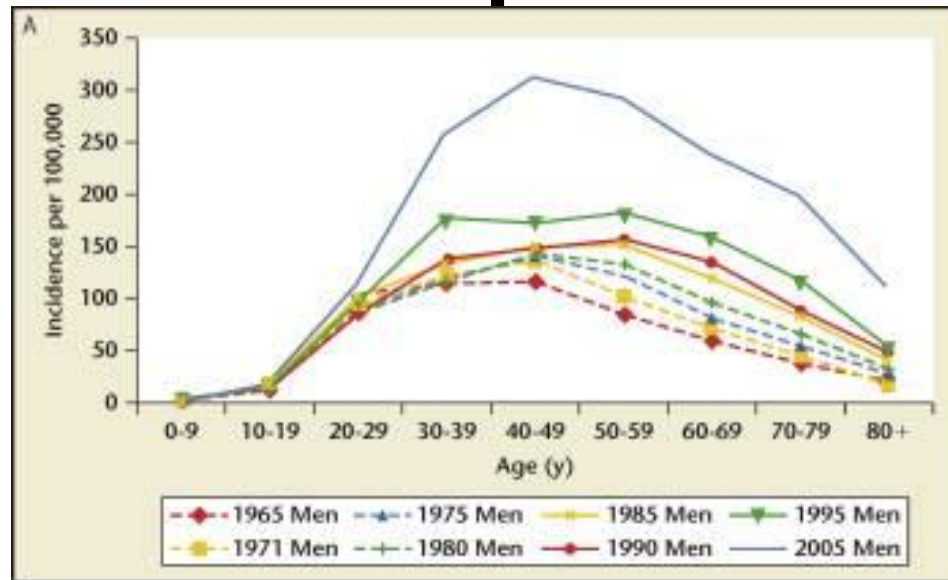
- **Prevalence has doubled since 1960's**
- **Lifetime risk 8-12% (M) and 5-7% (F) but rising**
- **Annual cost in US approx \$5 BILLION!!**



# Prevalence USA 1970's – 1990's



# Prevalence in Japan: 1965 - 2005



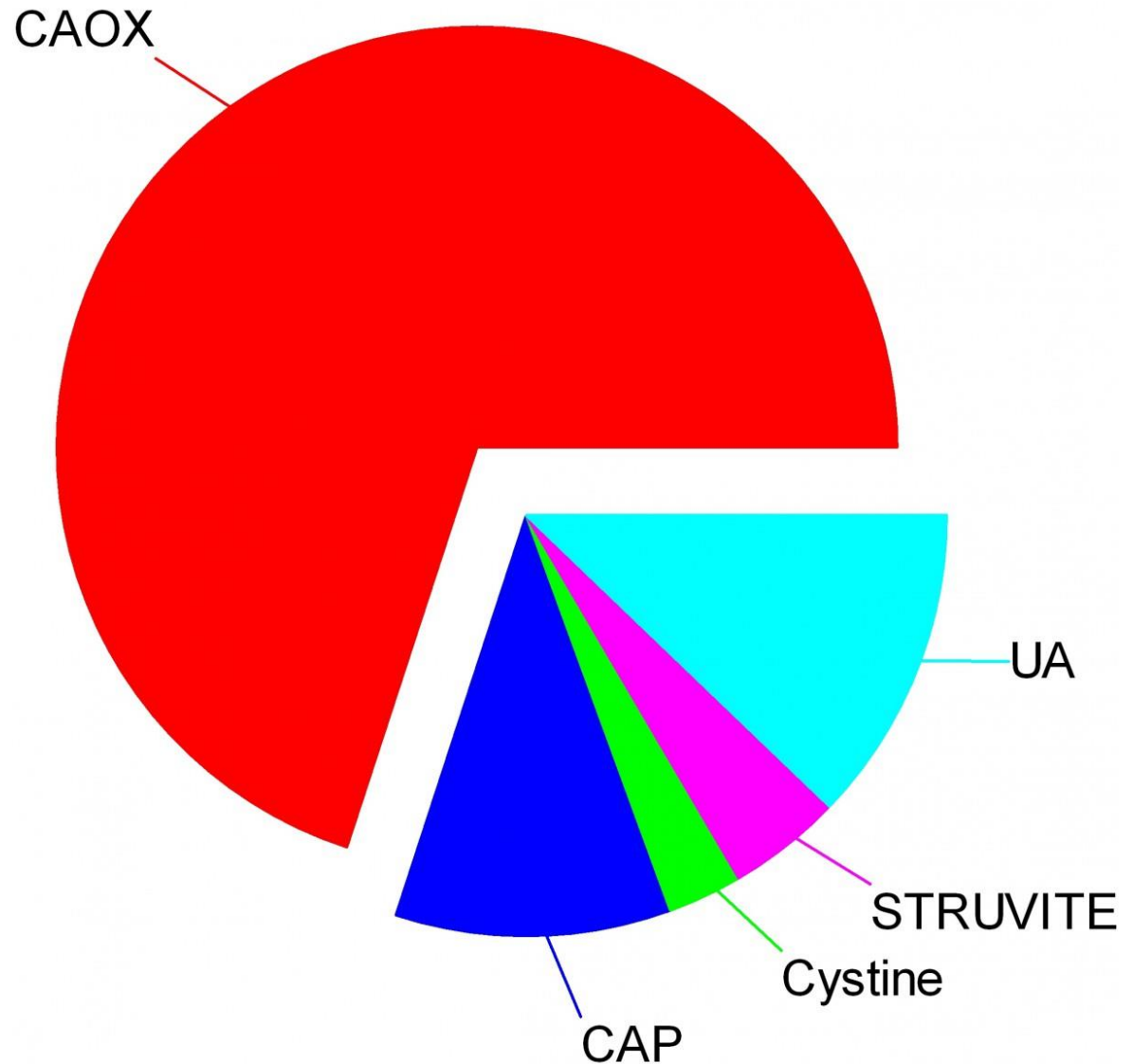
# Risk Factors

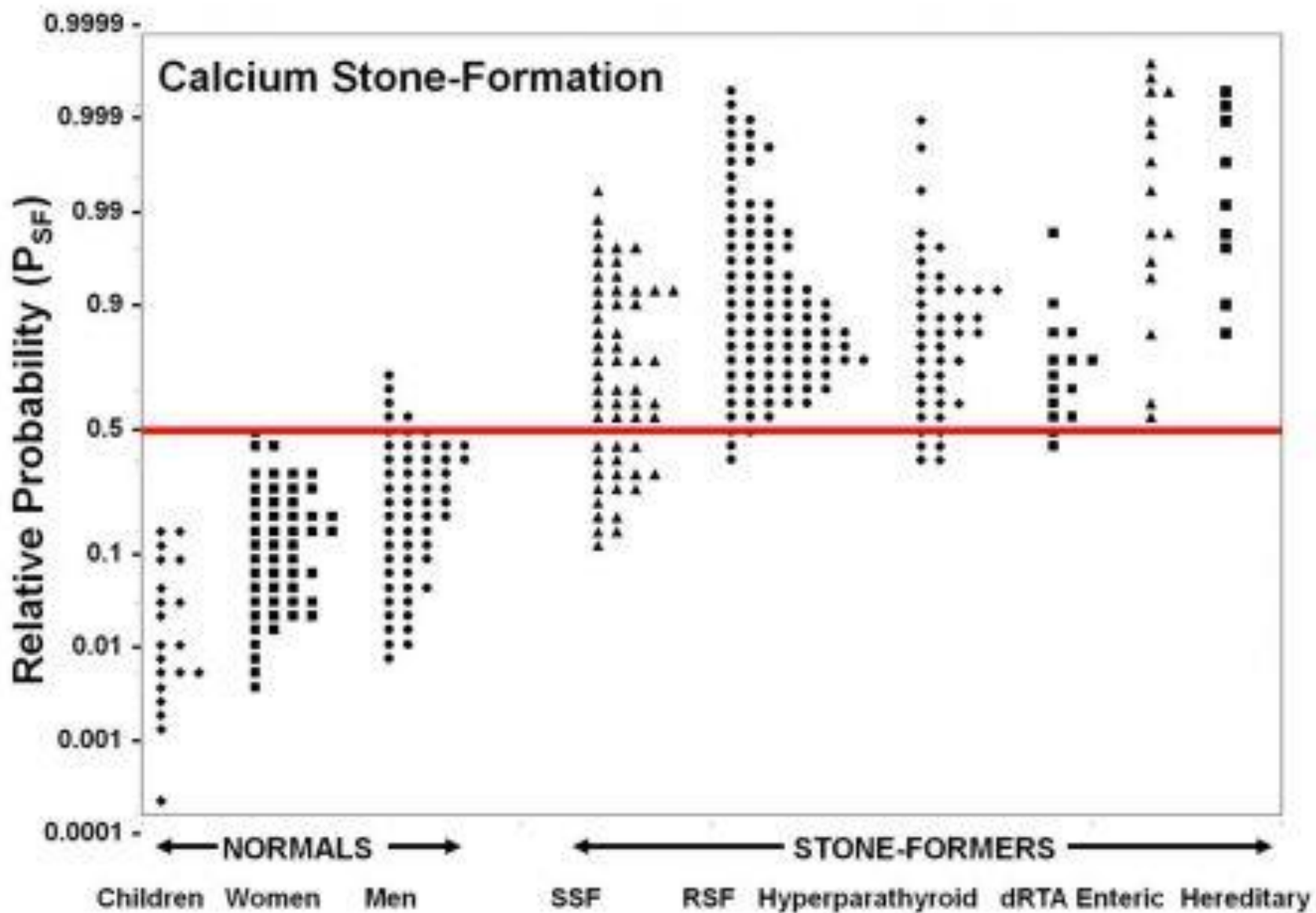
- **Genetics:**
  - Family History
  - Inherited defects (oxaluria, cystinuria, RTA)
- **Lifestyle**
  - Poor hydration
  - Animal protein
  - Obesity AND bariatric surgery
  - Salt intake
- **GI inflammatory conditions**
  - Crohn's disease
- **Metabolic**
  - Hypercalcaemia

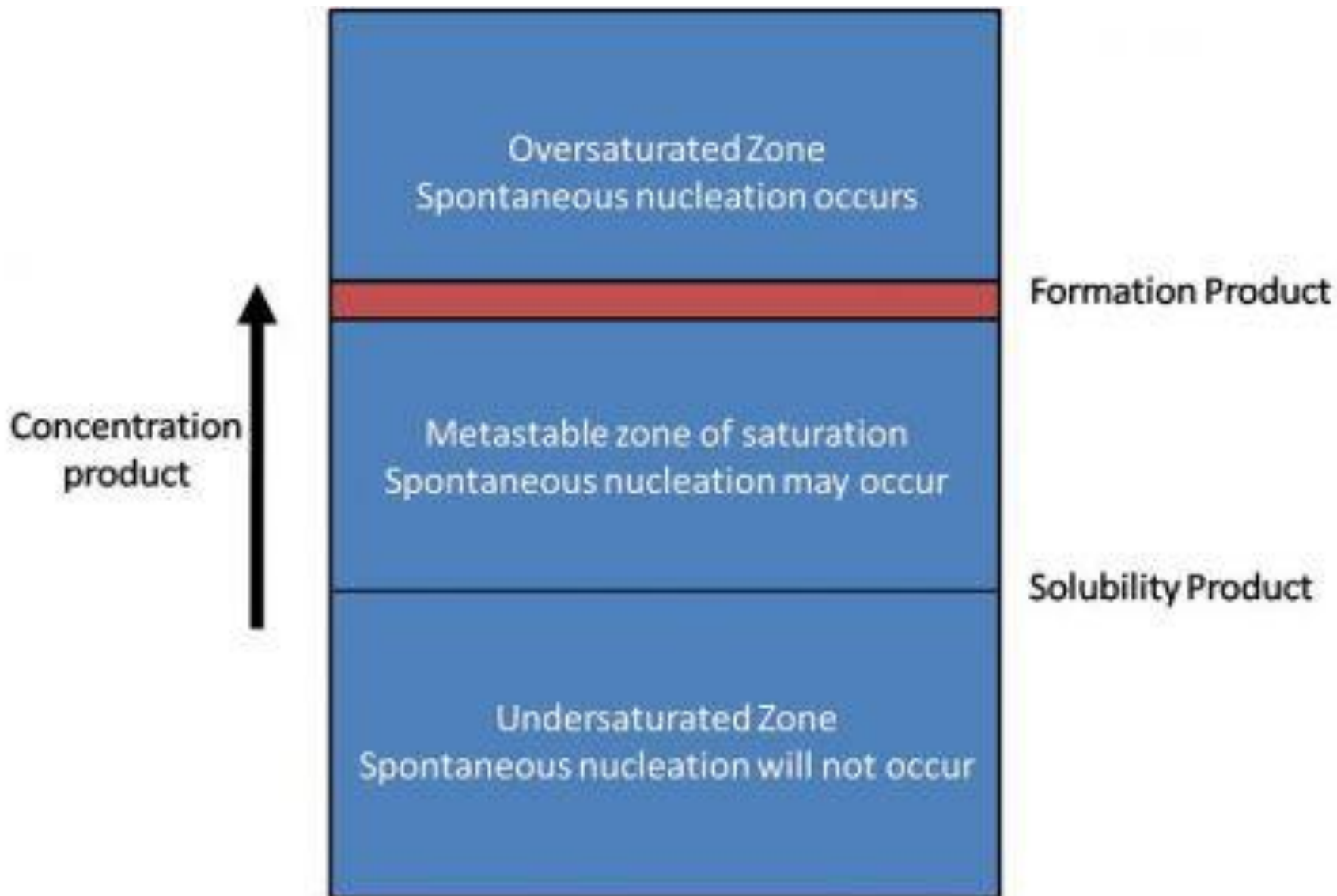
# Pathophysiology

# Stone composition

- Calcium oxalate (+ mixed)
- Uric acid
- Calcium phosphate (+ mixed)
- Struvite
- Cysteine
- Others







# Renal Stones



# Clinical Presentation

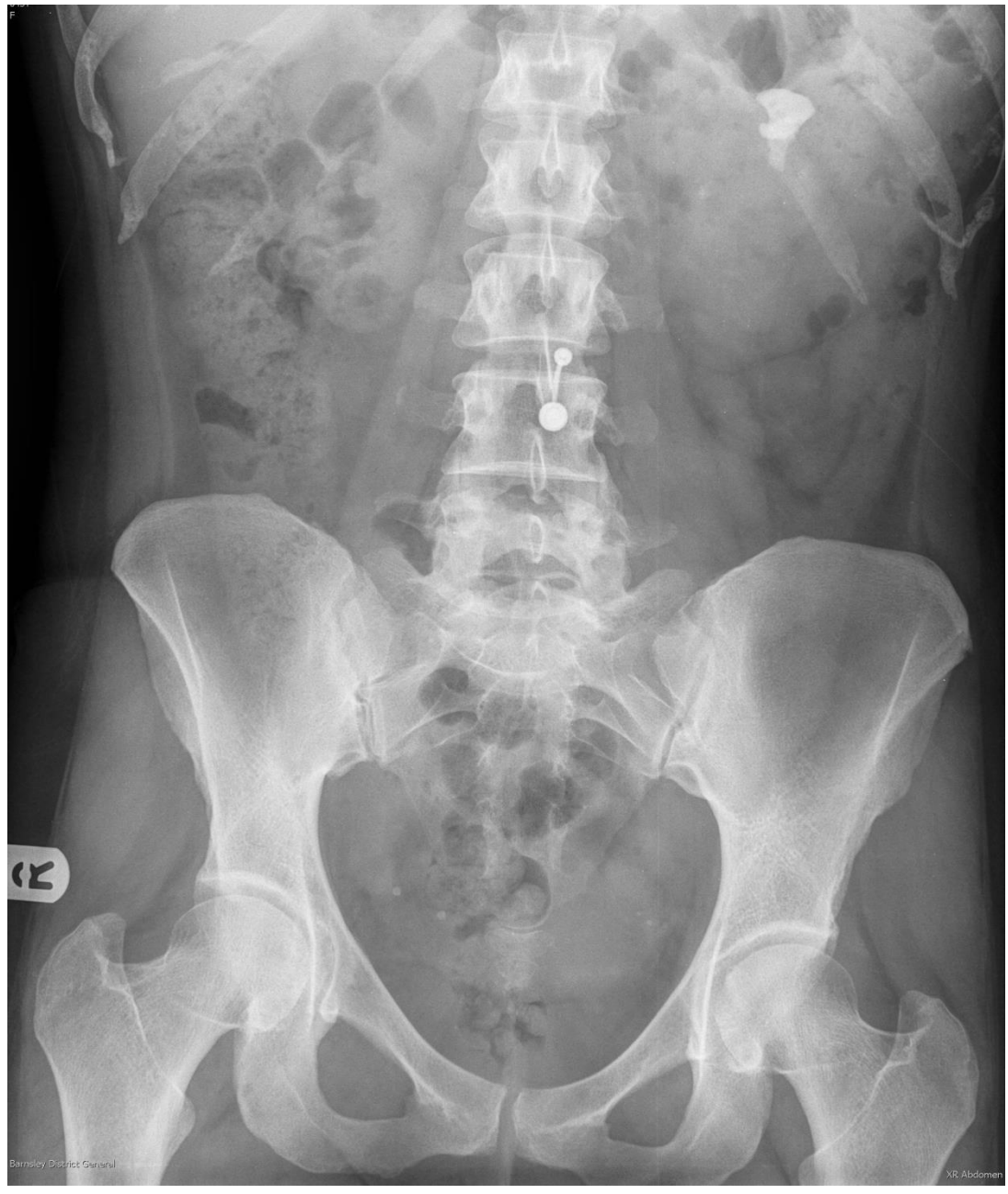
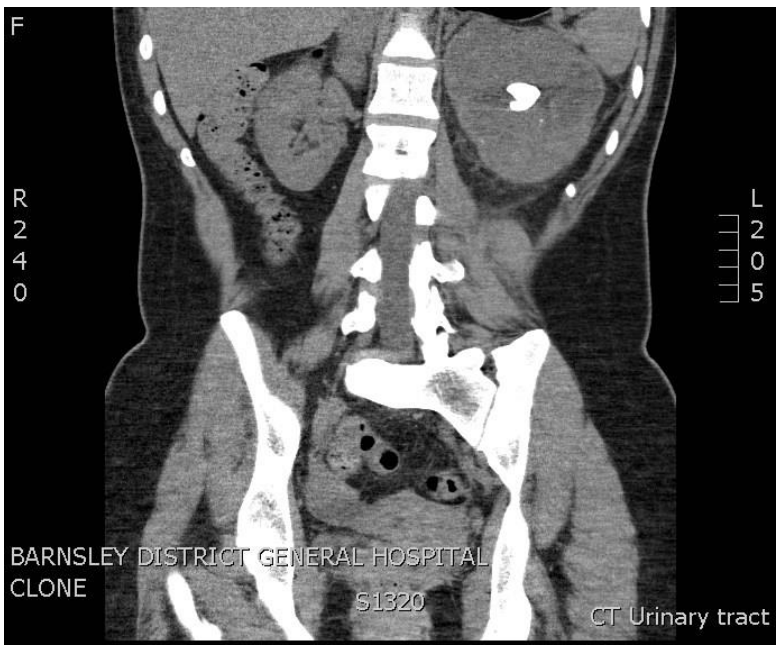
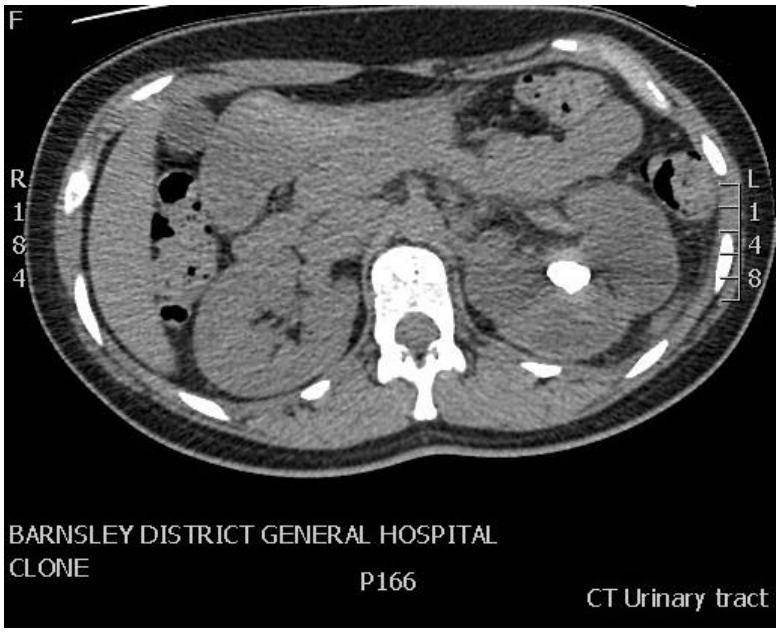
- **Incidental finding on US scan**
- **Loin ache**
- **Haematuria clinic**
- **Pyelonephritis**
- **Chronic kidney disease**

# Important Things to Ask

- **Duration, characteristic, location of pain**
- **Past history of urinary calculi**
- **Family history of calculi**
- **Previous stone procedures**
- **History of UTIs**
- **Loss of renal function**

# Calcium Oxalate Stone





# Treatment

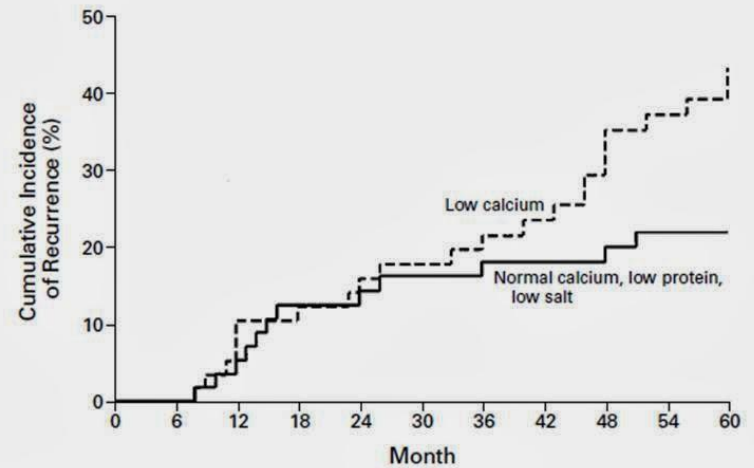
# Primary Care Management

- **Renal stone**
  - **Check bone profile and U.A.**
- **Recurrent stone formers**
  - **Lifestyle compliance**
- **Community Based Follow-up?**

# Prevention!



COMPARISON OF TWO DIETS FOR THE PREVENTION OF RECURRENT STONES

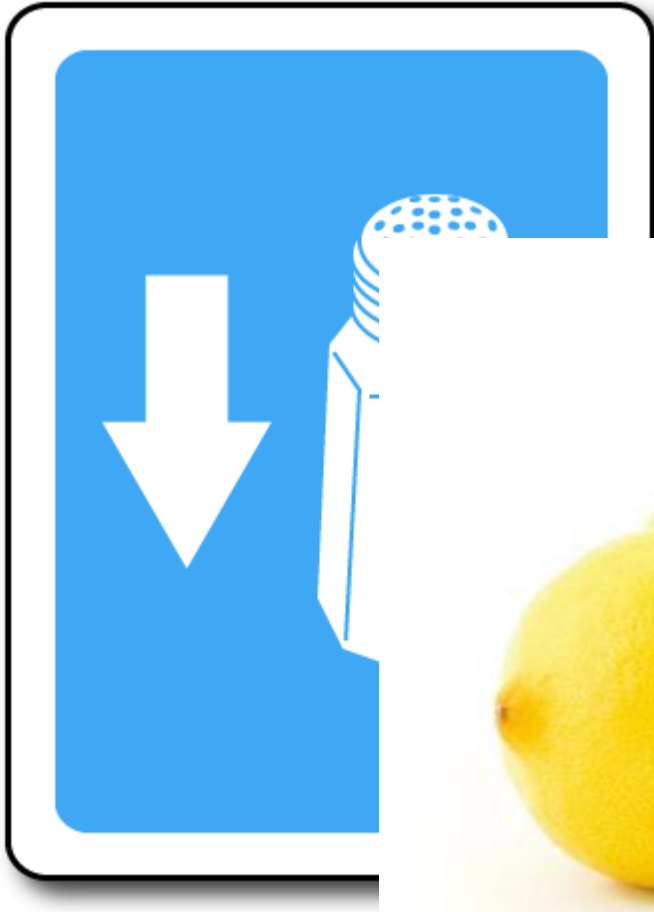


No. AT RISK

Low calcium	60	59	51	49	46	44	42	39	33	31	28
Normal calcium, low protein, low salt	60	57	53	47	46	45	44	43	41	40	40

Figure 2. Kaplan-Meier Estimates of the Cumulative Incidence of Recurrent Stones, According to the Assigned Diet.

# Prevention!





# Prevention!

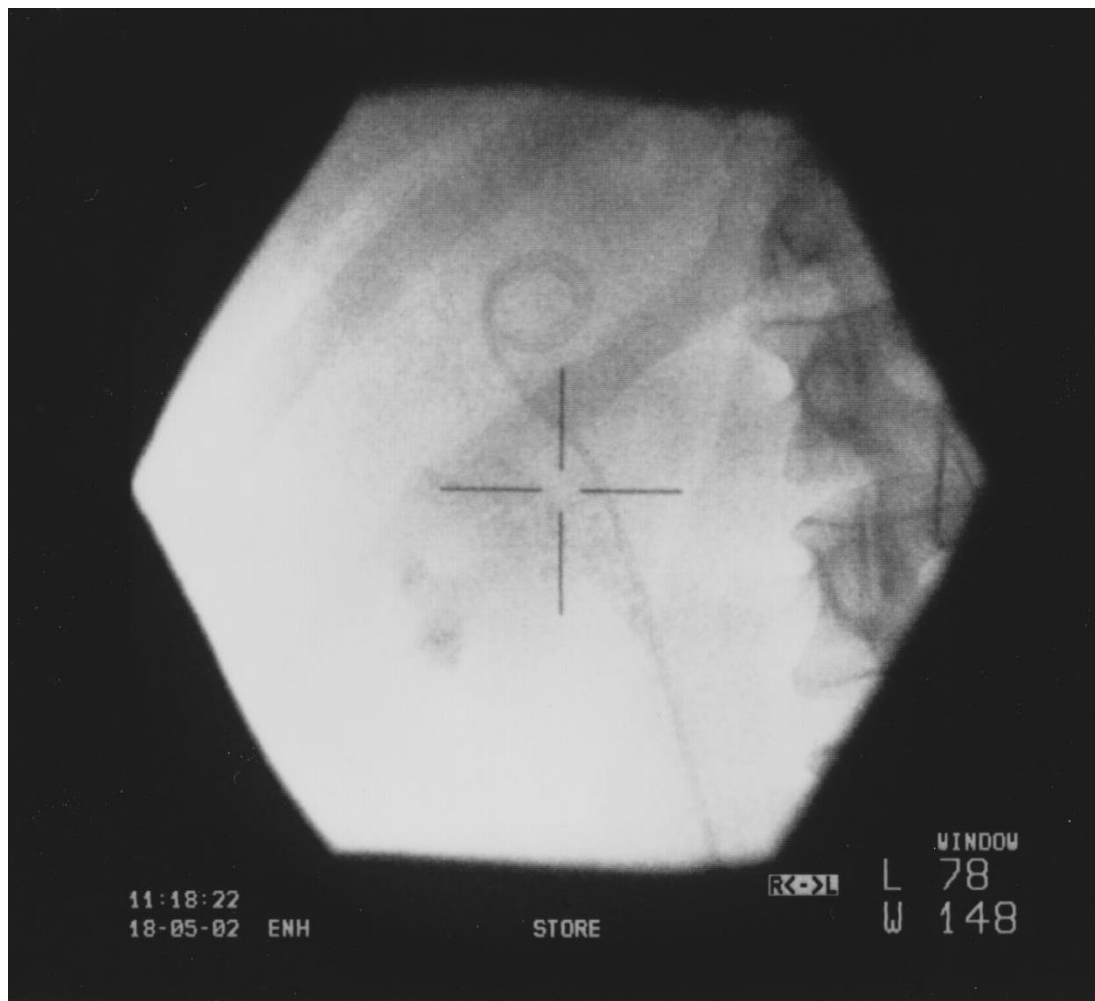
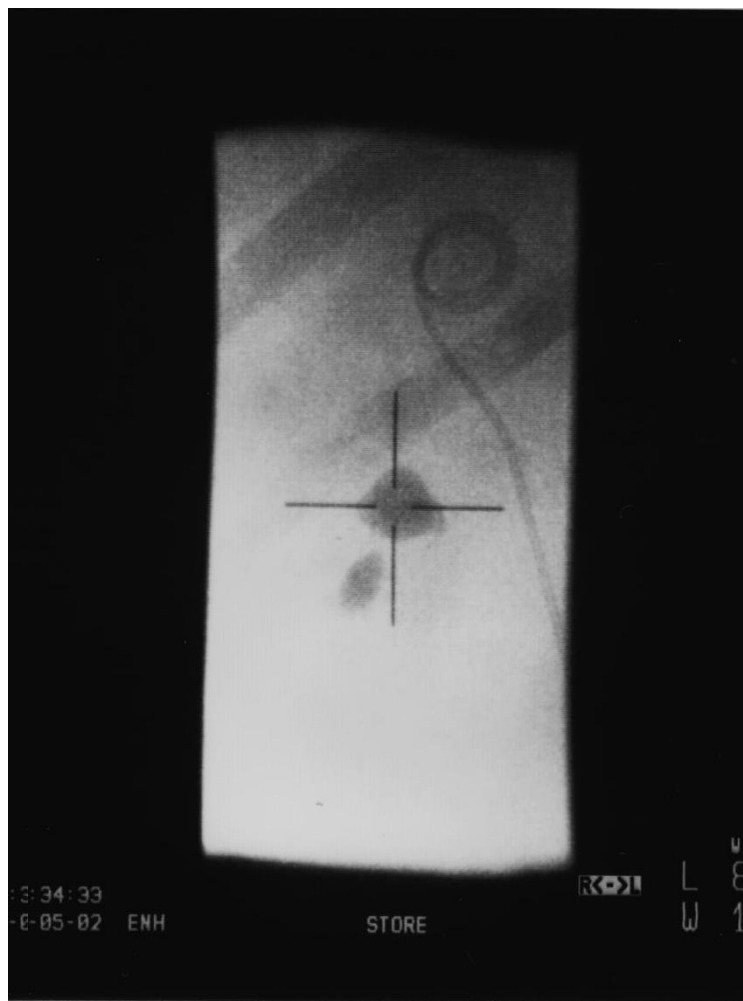


# Treatment Options

- **Do nothing** (ideal for small stones, elderly patients, obese, warfarin etc)
- **Lithotripsy (ESWL)**
- **Flexible uretero-rensoscopy**
- **PCNL**
- **(Open Surgery)**

# Third Generation Lithotripter





# Laser Lithotripsy



**Holmium laser 2140nm - absorbed by water**

**Dual energy output – 20W (stones); 100W (prostate)**

**Most efficient stone treatment available**

**“Gold Standard” for prostatectomy**





0171  
E



SUPINE



Barnsley General Hospital

SV-319  
ZP: Alobosari

08/04/2016  
09:40:00  
IM:3



08/04/2016  
09:51:00  
IM:4

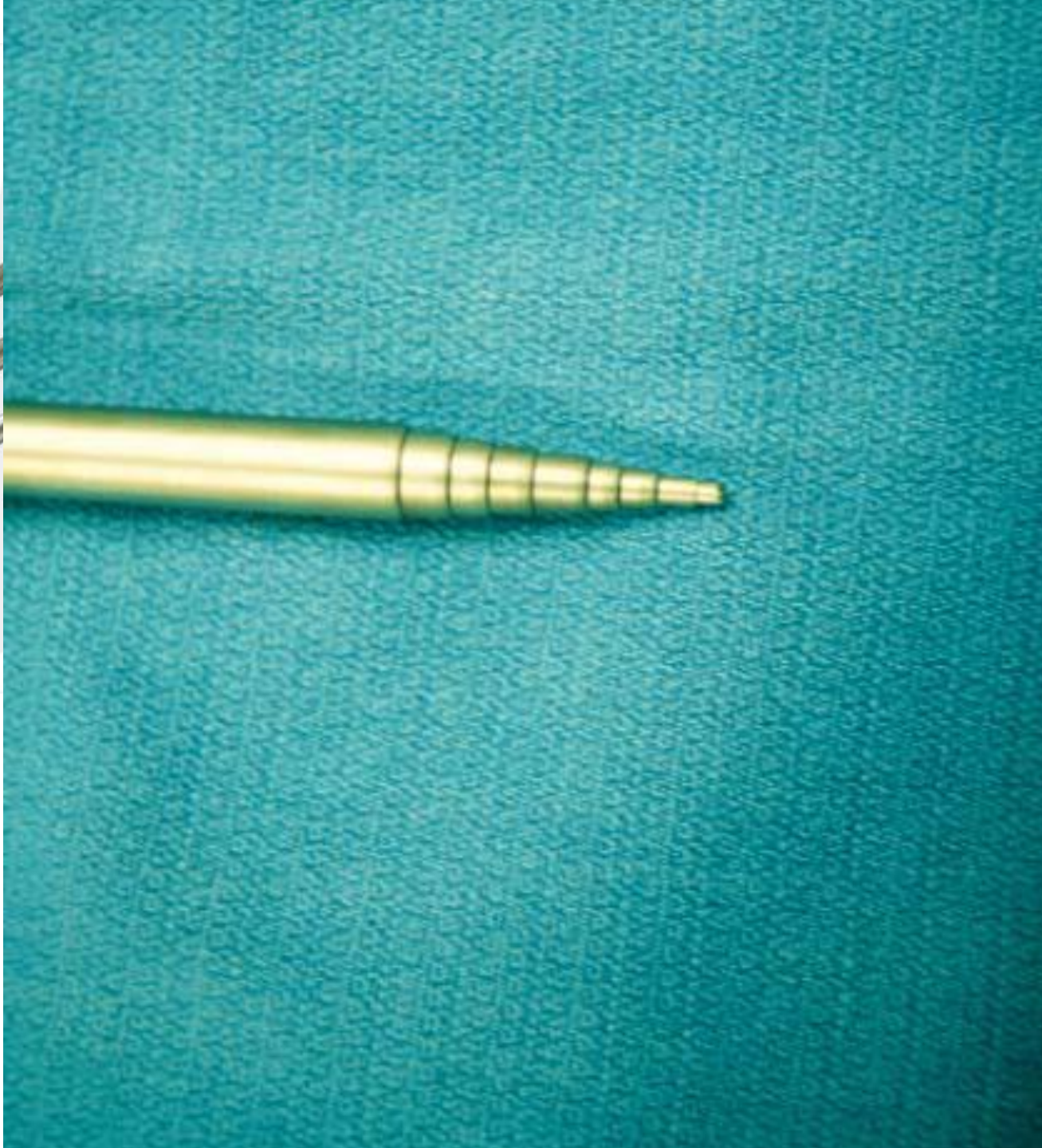


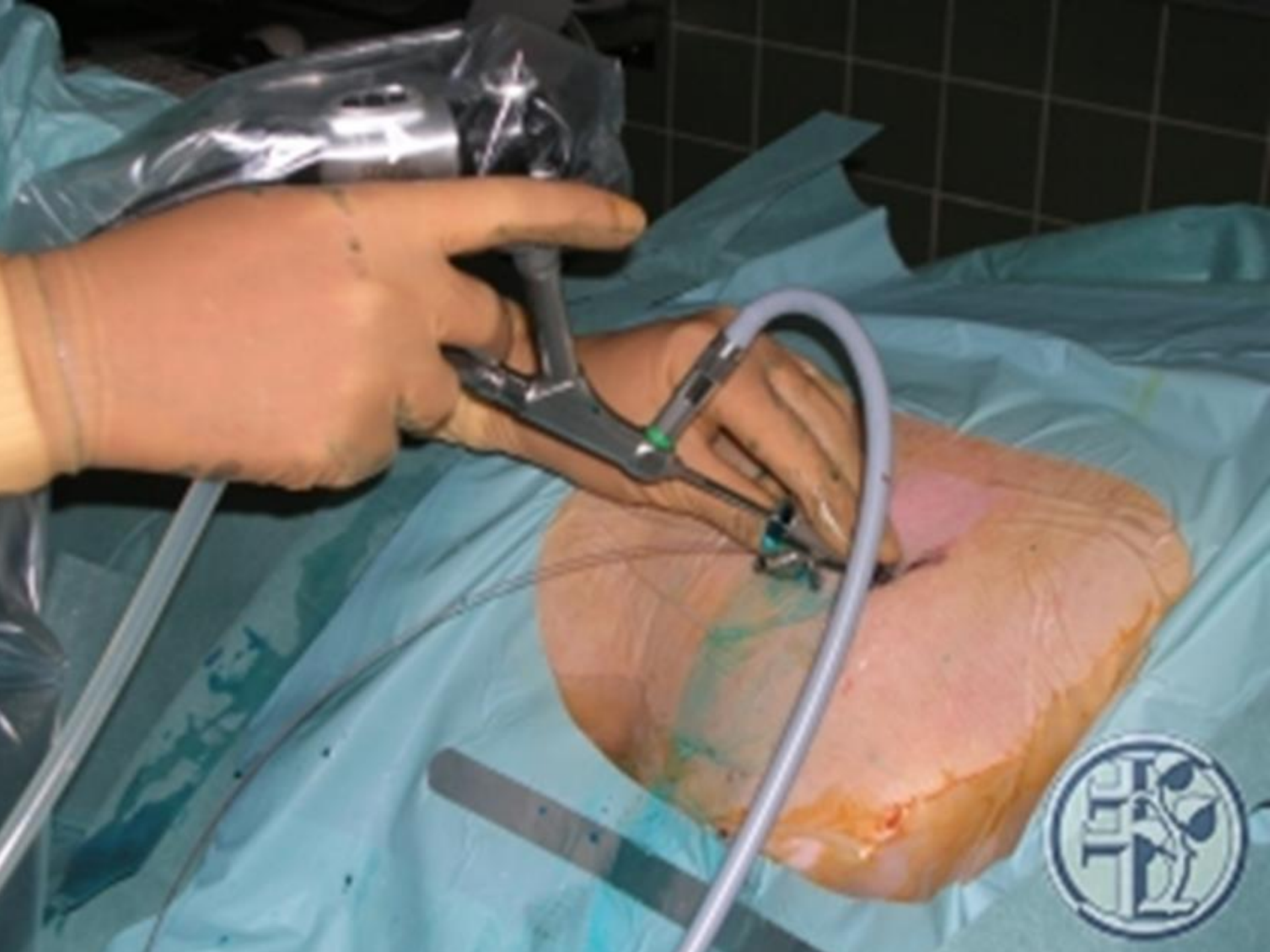


# **Percutaneous Nephrolithotomy (PCNL)**

- **First performed 1976**
- **Percutaneous access to kidney**
- **Tract dilated**
- **Sheath placed into collecting system**
- **Stones removed / destroyed**







# Precision Technology



# Swiss Lithoclast Master





PCNL scar

Pyelolithotomy scar  
and drain

# Ureteric Stones



# Presentation

- **PAIN!!!!!!!!!!!!**
- **Intermittent loin ache**
- **Haematuria clinic**
- **Pyonephrosis**
- **Asymptomatic hydronephrosis (rare)**
- **AKI (bilateral stones or solitary kidney)**



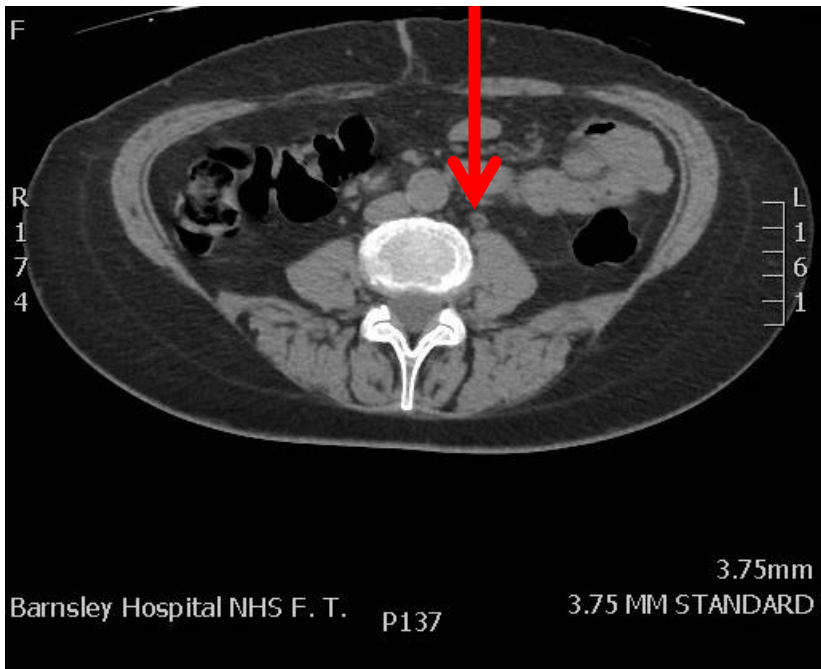
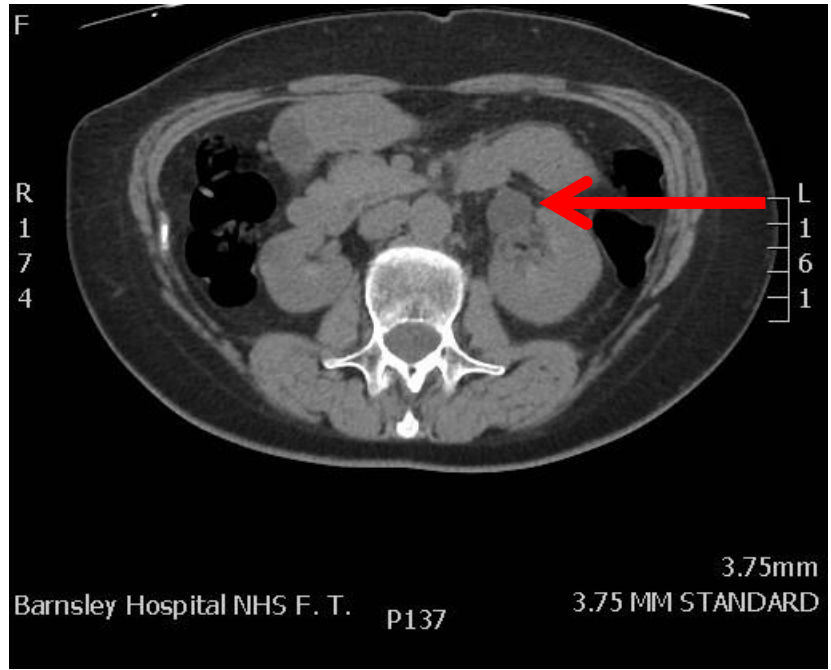
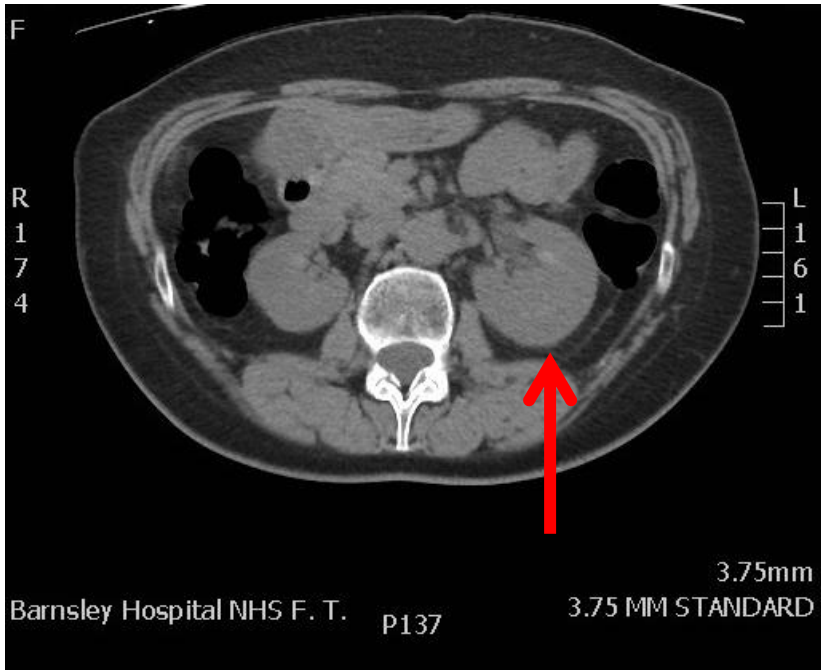
**Agony**



**Pain**

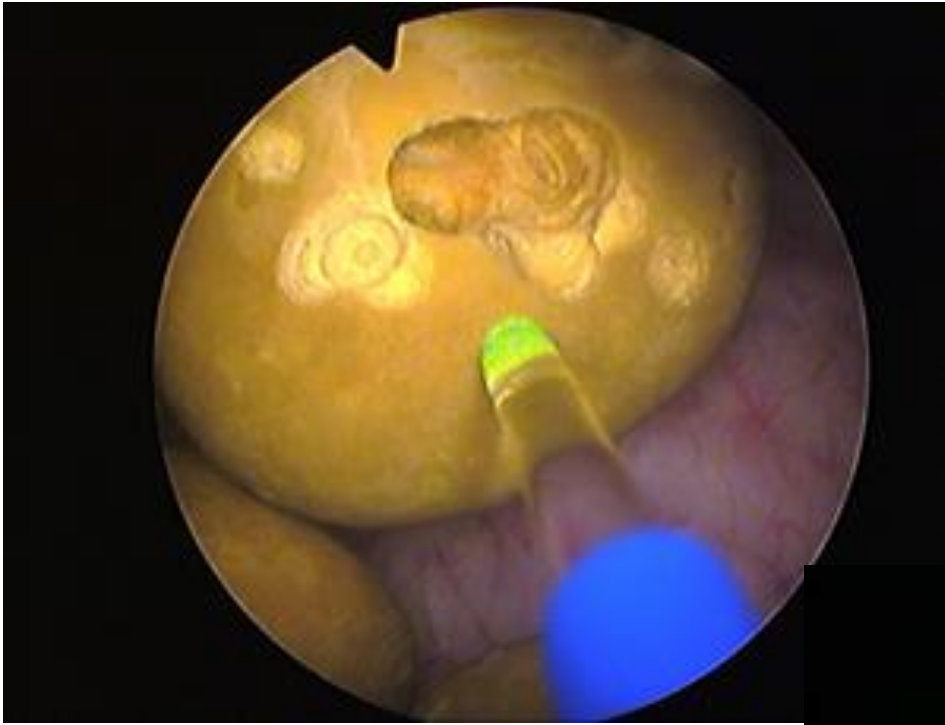


**Misery**



# Storz 7Fr Ureteroscope





**What's New?**

# **SUSPEND trial**

- **European Clinical Trials Database, EudraCT number 2010-019469-26**
- **1136 patients randomised to tamsulosin, nifedipine or placebo**
- **No difference between treatment and placebo (P=0.78)**
- **No difference between tamsulosin and nifedipine (P=0.77)**

# Summary

- **Common and getting more common**
- **Lifestyle MAJOR influence**
- **Renal stones generally present to GP**
- **Ureteric stones generally to A/E**
- **Lots of treatments available**
- **Bone profile and U.A. should be checked**



Urology Community Services ?