

## CHAPTER 7 - THE URINARY SYSTEM

### 1 INTRODUCTION

The kidneys, ureters, bladder and urethra collectively form the urinary system and are not normally affected by flying. Abnormalities of the urinary tract are usually associated with infection, inflammation and obstruction, all of which can cause pain which may be severe enough to be incapacitating.

Any abnormality of the urinary tract requires investigation prior to the issue of an initial certificate. However, re-certification may be considered if the individual is asymptomatic.

### 2 URINE

The urine should be analysed at each examination and should be clear of blood, protein and sugar. A trace finding of protein is probably of little significance if present in isolation but should be recorded for comparison at future examinations. A trace of blood likewise, is usually benign, but if it persists should always warrant further investigation. The presence of significant haematuria or proteinuria requires full assessment before a decision can be made on fitness to fly and a temporarily unfit assessment may be necessary until the results of investigation are known.

### 3 URINARY INFECTION

Infection is the most common urinary tract condition. It may be acute, chronic, incapacitating or asymptomatic. It is disqualifying until properly investigated, diagnosed and treated.

#### 3.1 Acute infection

This may be associated with anorexia, pyrexia, dysuria, polyuria, renal pain, headache and nausea. The pilot should be assessed as temporarily unfit until asymptomatic and the urine clear. Extended treatment may be required, however, flying may be possible if the medication is without side effects.

#### 3.2 Chronic infection

Recurrent and chronic infection will cause rejection at initial examination. After full renal assessment and demonstrated recovery, certification and re-certification may be considered. Chronic infection is often associated with anatomic abnormalities which may be surgically corrected. A demonstrated recovery over a sufficient period of time should allow certification.

#### 3.3 Renal tuberculosis

This deserves mention as a chronic infection which will require extended treatment. A temporarily unfit assessment is required until the urine is clear and the treatment is stabilised and has no apparent side effects.

#### **4 UROPATHIES**

Chronic urinary obstruction from many causes may lead to uropathy. However, relief of obstruction is associated with an excellent renal prognosis and, therefore, following surgical relief unrestricted certification may be considered by the AMS. Following nephrectomy an individual may be considered fit subject to a satisfactory assessment of the remaining kidney.

**3, 4 – These assessments apply to Class 1 and Class 2**

#### **5 CHRONIC RENAL DISEASE**

Individuals with minor urinary abnormalities such as microscopic haematuria or mild proteinuria may be suffering from an underlying glomerular nephritis, typically IgA disease. In the majority of cases, this will have a benign course and there is no requirement to restrict or deny certification. Features suggestive of progression of disease are the development of hypertension, heavy proteinuria and a rising serum creatinine. With normal or well controlled blood pressure, these subjects are not at risk of incapacitation until creatinine clearance levels fall below 20 mls/min. Below these levels, certification will only be permitted at the discretion of the AMS and in exceptional circumstances. Each individual will require careful follow-up and assessment. The requirement for dialysis will normally preclude all forms of certification to fly.

#### **6 RENAL TRANSPLANT**

An individual with a good response to transplantation may be considered for restricted re-certification if renal function is normal, there is no hypertension and the immuno-suppressive regime is acceptable. A period of one year post operative temporarily unfit assessment is necessary to ensure stability. In view of the greatly increased cardiovascular risks following transplantation, a full cardiovascular profile to include an exercise stress test should be performed prior to consideration by the AMS of restricted certification. After a period of stability certification with OML/OSL limitation may be possible with periodic AMS review.

**6 – This assessment applies to Class 1 and Class 2**

#### **7 CALCULI OF THE RENAL TRACT**

Urinary calculi (stones) may be found at all points within the urinary tract. Symptoms are produced by obstruction and associated spasm of the smooth muscle in the tract wall. Calculi vary in size, consistency, composition, shape and texture as do the dimensions of the renal tract. Any movement is therefore unpredictable in terms of the abruptness of onset and severity of pain. The varying G-forces to which an individual is exposed during flight are particularly likely to dislodge renal calculi, and so any radiopaque lesion of the parenchyma will require urological investigation.

##### **7.1 Asymptomatic stone(s)**

The existence of calculi may be completely unknown to the applicant because of being asymptomatic and could be accidentally demonstrated during instrumental check-up performed for other reasons. In such cases, the AMS may consider recertification with a multi-pilot limitation (Class 1 'OML') or safety pilot limitation (Class 2 'OSL') for one year. After this period of

documented freedom from symptoms unrestricted certification may be considered by the AMS both for Class 1 and Class 2. A regular follow-up with echography is required for every visit and it should demonstrate no volume increase of calculi and no movement of calculi from their original position.

## 7.2 Residual stone(s)

A residual stone, or stones, may often be asymptomatic. If in the collecting system, they remain a hazard and should be cleared before the individual can be assessed as fit to fly. If the stone is parenchymal or in a calyceal cyst, then the hazard is minimised and the applicant may be considered fit for multi-pilot operations (Class 1 'OML'), safety pilot (Class 2 'OSL') or unrestricted Class 2 by the AMS.

## 7.3 Recurrent renal colic

Recurrent renal colic when associated with calculi must be investigated. If a comprehensive urological examination indicates a condition susceptible to treatment and subsequent review over an extended period after treatment shows no change, the individual may be assessed as fit. Certification of individuals may be considered at an earlier stage for Class 2 than Class 1. Urological follow-up with radiological examination shall be required by the AMS.

## 7.4 Modes of treatment

These include direct surgical approach, percutaneous nephrolithotomy (PN) and extracorporeal shock wave lithotripsy (ESWL). Each method has advantages and disadvantages. However, each case must be fully recovered from the procedure with all signs of calculi having been cleared before full re-certification can be approved by the AMS. Follow up is important in all cases.

**7 – These assessments apply to Class 1 and Class 2**

## 8 CONGENITAL RENAL TRACT ABNORMALITIES

### 8.1 Polycystic kidneys

Polycystic kidneys are frequently asymptomatic and the individual may be unaware of his condition in the absence of a recognised family history. If the individual is aware of his condition, even if asymptomatic, then the potential for acute colic, infection, development of hypertension and renal failure, and the association with berry aneurysm and subarachnoid haemorrhage precludes initial Class 1 certification. If symptomatic, restricted recertification may be considered by the AMS with careful follow-up and assessment. Minor degrees of asymptomatic polycystic kidney may be considered by the AMS, for initial and renewal Class 2 certification following investigation and follow-up.

### 8.2 Medullary sponge kidney

Medullary sponge kidney may vary in severity and presents with renal colic, haematuria or intercurrent infection. Each case must be assessed individually, however, the probability of recurrent calculus formation with the associated risk of renal colic makes it unlikely that single crew operation would be acceptable. Each case requires consideration by the AMS.

## 9 GENITOURINARY MALIGNANCY

Such cases if fully treated may be assessed under the criteria noted in the oncological chapter and can be returned to flying in many cases.

## **10 OTHER URINARY TRACT SURGERY**

Most surgery is carried out in order to correct abnormalities which have reduced renal function. The assessment will depend upon a return to normality and will require specialist assessment by the AMS.

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