overactive bladder (OAB):

1) *Duloxetine:* an experimental class of agents which appear not to affect the normal bladder, but in animal studies of chemically-irritated bladders, reduces over-activity of the bladder.

2) *Desmopressin:* DDAVP: use in children with bedwetting (nocturnal enuresis) but may also be useful in OAB in adults. Taken at bedtime, it can reduce urine output for 6 hours, which allows uninterrupted sleep during that period.

However, this treatment carries risks of fluid overload and low plasma sodium (hyponatraemia) after excessive fluid intake; severe hyponatraemia can cause seizures and coma.

Electrolyte monitoring on initiation with this drug should reduce this risk. Patients with disrupted electrolyte balance (due to kidney problems for example) or with cardiac disorders, should be treated with extreme caution (or not at all).

3) *Potassium channel openers:* cromakalin, levcromakalin, relax smooth muscle. However, there is at present no clinical evidence of benefit whilst there is a high side-effect profile. Some pharmaceutical companies are currently trying to develop bladder-specific drugs of this type.

4) *INTRAVESICAL THERAPY:* delivery of the drug directly into the bladder. This has been shown to be effective with anticholinergic drugs, but necessitates repeated manipulation of the lower urinary tract.

The advantage is that high doses can be delivered, with a much lower rate of side-effects. Oxybutinin may be more easily tolerated by this mode of administration, in selected, willing

patients, plasma levels reaching those of oral administration, but with much lower incidence of dry mouth.

Other drugs introduced by this route include: lidocaine(a local anaesthetic agent) and verapamil.

UROS: a long-lasting intravesical pump under development in California. A reservoir is positioned in the bladder and constantly releases a precise amount of drug into the bladder; this may be a future treatment for bladder spasms, pain or even cancer.

5) *Intravesical capsaicin:* this is a substance P antagonist. Substance P is involved in inflammatory processes. Capsaicin has only had limited success. Initially it causes severe discomfort or pain but later reduces pain sensation and may functionally decrease detrusor instability.

Thus far it remains an experimental technique. It has been used to treat detrusor hyperreflexia, and in a recent study 44% of patients treated with intravesical capsaicin achieved satisfactory continence, 36% were improved and 20% failed to improve.