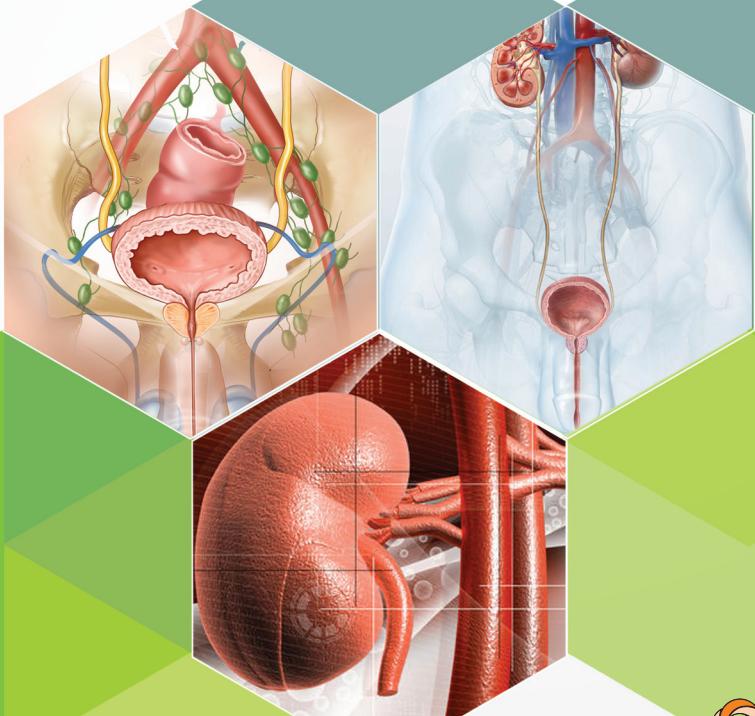


Drug INDEX

PASSI PUBLICATIONS

SPECIAL SUPPLEMENT FOR SUN PHARMACEUTICAL INDUSTRIES LTD.



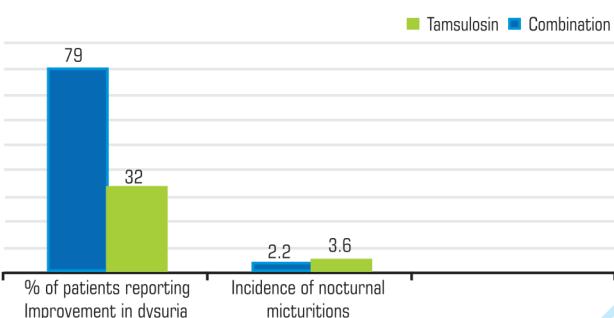
In moderate to severe LUTS due to BPH



Tamsulosin HCl 0.4 mg + Dutasteride 0.5 mg Capsules

ACCELERATED CONTROL. AT EASE

- The combination therapy (Dutasteride + Tamsulosin) showed better efficacy towards improving the symptomatology of the BPH when compared with Tamsulosin monotherapy
- Combination therapy (Tamsulosin+Dutasteride) offered better improvement in Nocturia & Dysuria *



1. Tartari et al. European urology supplement October 2011

CONTENTS •

⇨ Corporate Profile	IV
⇨ Uro Watch	V
⇨ Uro Guide	VIII
⇨ Product List	XI
⇨ Section Contents	1

The contents of this publication are sourced as available, compiled and designed by Passi Publications Pvt. Ltd. exclusively for Sun Pharmaceutical Industries Ltd. While every effort has been made to ensure the accuracy and correctness of the contents, the editors, the publisher and the sponsor accept no responsibility for any errors, omissions or inaccuracy caused for any reason whatsoever. Opinions expressed do not necessarily reflect the views of the editors, publisher or the sponsor.

SUN PHARMACEUTICAL INDUSTRIES LTD.

Sun Pharmaceutical Industries Ltd., the knowledge driven company, is an international speciality pharma company, with a large presence in US and India, and a footprint across 41 other markets. Sun Pharmaceutical Industries Ltd. began in 1983 with just 5 products to treat psychiatric ailments. Since then Sun Pharmaceutical Industries Ltd. have crossed several milestones to emerge as a leading pharma company in India where it is the 5th largest by prescription sales, a rank that has been retained over a decade (IMS ORG Stockist Audit, March 2012).

In the US, which is the company's largest market, by providing total healthcare solution, the company has built a strong pipeline of generics, directly and through their subsidiaries Caraco and Sun Pharmaceutical Inc. Taro adds strong dermatology range to this portfolio.

Sun Pharmaceutical Industries Ltd. is a multi-product multi-faceted company catering to a wide spectrum of healthcare needs in India and rest of the world markets. The company's brands are prescribed in chronic therapy areas like cardiology, psychiatry, neurology, diabetology, ophthalmology, orthopedics etc. The company is leading the market in specialty therapy areas in India.

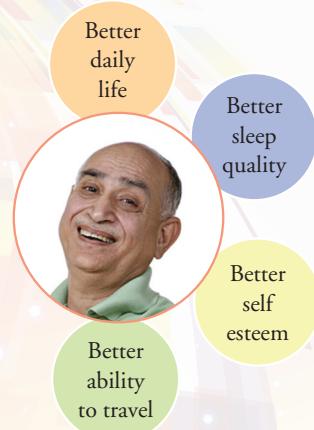
The company is moving towards a long-term goal of discovery, development, manufacturing, marketing and sales of prescription products that fulfill unmet medical needs. Since the mid-nineties, the company has used a combination of growth and acquisition to drive growth. Important acquisitions include those of the US, Detroit-based Caraco Parma Labs and a plant at Halol which now holds UKMHRA and USFDA approvals. The 2010 acquisition of Taro Pharmaceuticals doubles our US business and adds strength in dermatology and pediatrics for the company.

The company is now on its way to the future, with brands registered in major branded generic markets of the world, and in most of these markets, promoted by a high quality field force. In the high value US generics market the company is working to become a trusted, high quality generic company, with a balanced portfolio comprising both of complex and simple-to-file generics including injectables, controlled substances and dermatologicals. With the rise in business the insistence on technology and the cost advantage will remain unchanged. The company is open to acquisitions in the US generic space.

The company's vision is not only to create novelty but to work hard, retain leadership and add to prescription share. Backed with a strong network and established company equity, the company would be an excellent partner for a company seeking to license out products across markets. Sun Pharma's philosophy envisages working towards high levels of transparency, accountability, consistent value systems, delegation across all facets of its operations leading to sharply focused and operationally efficient growth. The Sun Pharma of tomorrow will have brands registered in major markets of the world, and in most markets, promoted by a high quality field force. With a strong network and established company equity, Sun Pharmaceutical Industries Ltd. would be an excellent partner for a company seeking to license out products across markets.

New Trospium Chloride Extended-Release Formulation: What do studies say?

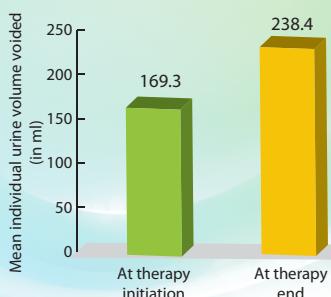
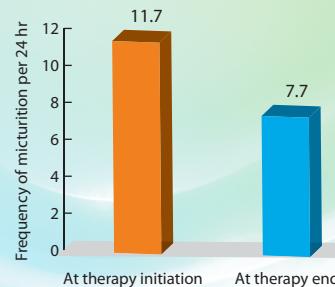
As per a recent multicentric, prospective observational study conducted under routine private practice conditions, treatment of overactive bladder with once daily trospium chloride 60 mg extended release capsules is very safe and very efficacious. A total of 305 patients with OAB syndrome (mean age 60 years, 79 % females) were evaluated in the study.



Treatment with once daily trospium chloride 60 mg extended release capsules significantly improved the frequency of micturition and nocturia, as well as incontinence episodes and use of absorptive pads in this patient population, accompanied by an improvement in quality of life.

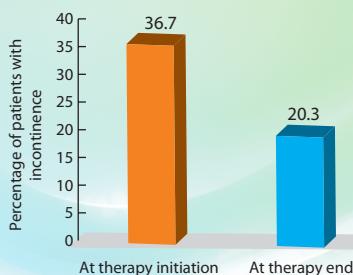
Results of trospium chloride extended release in OAB in a glance

- Mean daily frequency of micturition decreased



- Mean individual urine volume voided increased

- Proportion of patients with incontinence fell down



- Mean number of incontinence pads used declined from 3 per day to 1 per day
- More than one third of initially incontinent patients (39.3 %) needed no incontinence pads at the end of the treatment period
- Good safety and tolerability, with a particularly low incidence of mouth dryness (1 % of patients)
- No central nervous system (CNS) associated adverse events and no other serious adverse events occurred

SUCCESS SECRETS



Trospium Chloride Extended Release

So Tolerable! HOW?

"Sum of these characteristics may afford distinct advantages in treating OAB patients"

So Unique! HOW?

- Just once daily administration is sufficient
- Gentle on cognitive function
- Safe in multimorbidity & in polypharmacy

So User Friendly! HOW?

- Limited access of trospium to the CNS
- Absence of metabolic interaction potential via cytochrome P450

When there is rush to throw all out

An overactive bladder wants a rapid 'onset-of-effect' of the treatment

Time-to-effect with darifenacin in overactive bladder: A pooled analysis

Recently a study was conducted to assess time-to-effect with darifenacin in patients with overactive bladder (OAB). Efficacy and safety data were pooled from 1,059 patients (19–88 years, 85% women) randomized to darifenacin 7.5 or 15 mg once daily or matched placebo in three double-blind 12-week studies. The full analysis population comprised 1,053 patients. Statistically significant improvements were observed in all OAB symptoms (except nocturnal awakenings) for both darifenacin doses versus placebo at week 2, with further improvements over 6 and 12 weeks. Both darifenacin doses significantly improved all OAB symptoms from as early as days 6–8 versus placebo. Darifenacin 7.5 and 15 mg significantly reduced OAB symptoms throughout the study.

Khullar V, Foote J, Seifu Y, et al. *Int Urogynecol J.* 2011;22(12):1573–80.

Validity and Reliability of PPIUS for OAB

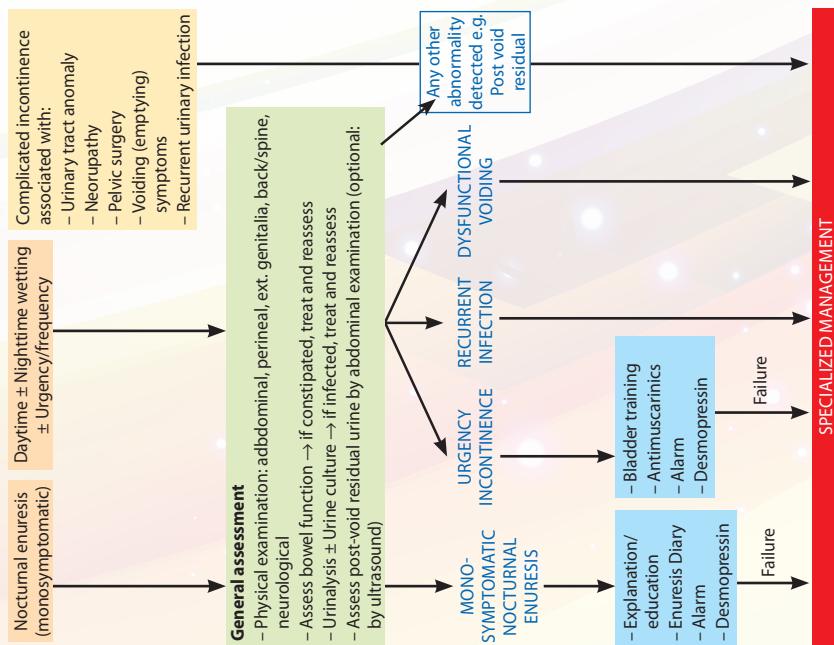
PPIUS is 'patient perception of intensity of urgency scale'. It is a patient-reported outcome instrument intended to measure the intensity of urgency associated with each urinary or incontinence episode. Recently a study was conducted to assess the content validity, test-retest reliability, and acclimation effect of the PPIUS in overactive bladder (OAB) patients.

Test-retest reliability was seen high based on intra-class correlation coefficient of 0.95. Among stable patients, the difference between the mean ratings of any two weeks was non-significant. Most of the participants found it simple to choose a PPIUS rating for each of their micturition episodes and the urgency rating definitions consistent with their urgency experiences.

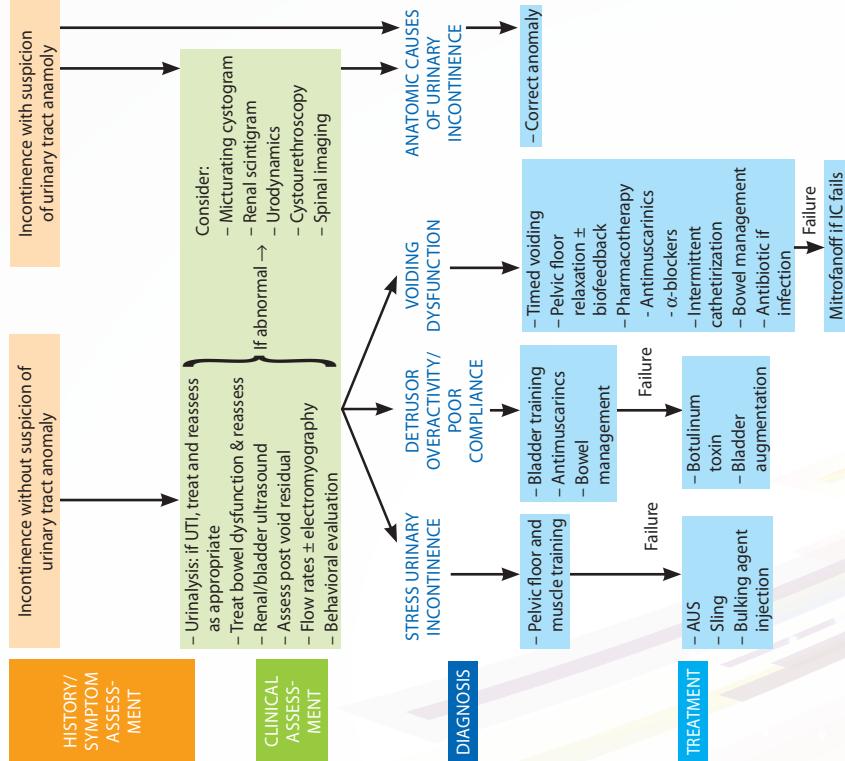
Content validity was found based on qualitative interviews, and excellent test-retest reliability among stable patients. Besides, no acclimation effect was observed among stable patients. The use of the PPIUS comes out as a reliable measure of urgency in both clinical trial and real life settings.

Notte SM, Marshall TS, Lee M, et al. *BMC Urol.* 2012;12(26)

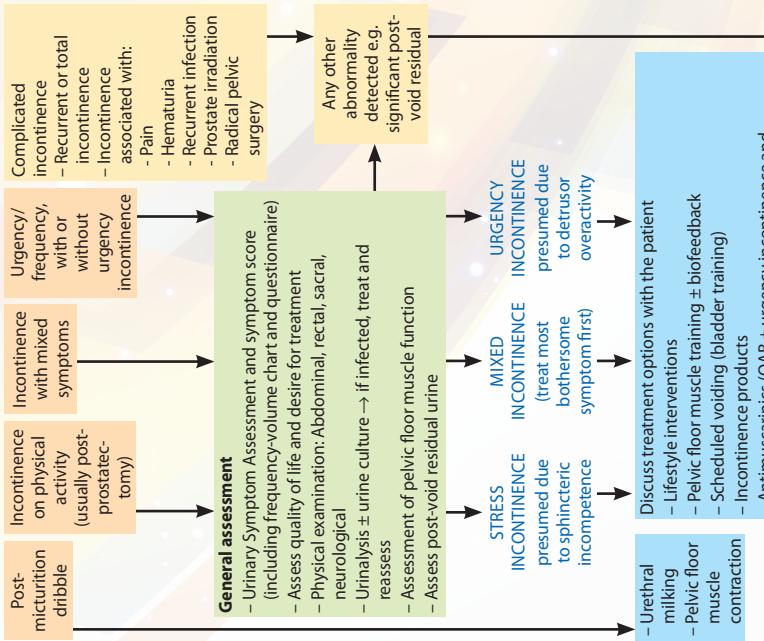
INITIAL MANAGEMENT OF URINARY INCONTINENCE IN CHILDREN



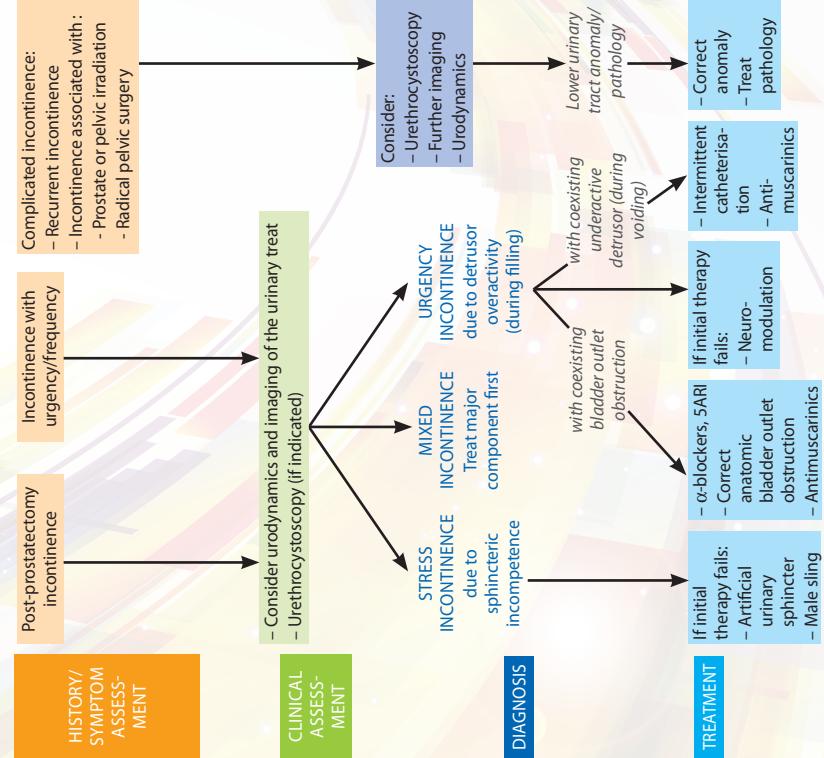
SPECIALIZED MANAGEMENT OF URINARY INCONTINENCE IN CHILDREN

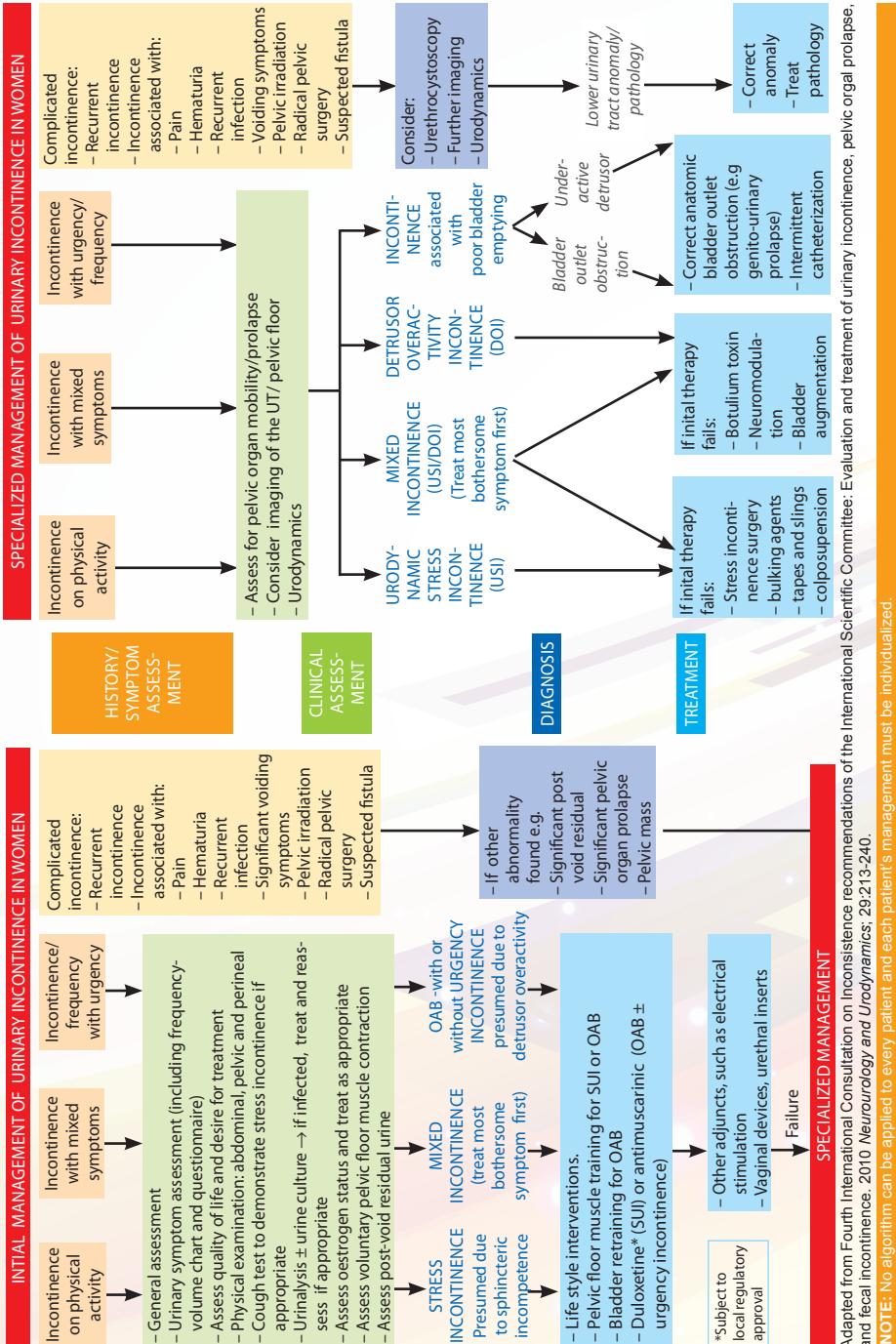


INITIAL MANAGEMENT OF URINARY INCONTINENCE IN MEN



SPECIALIZED MANAGEMENT OF URINARY INCONTINENCE IN MEN





*Subject to local regulatory approval

SPECIALIZED MANAGEMENT

BRAND	COMPOSITION
AFDURA	EACH FILM COATED BILAYER TABLET CONTAINS: ALFUZOSIN HYDROCHLORIDE BP (AS EXTENDED RELEASE) 10 MG DUTASTERIDE 0.5 MG
ANDROBLOK	EACH FILM COATED TABLET CONTAINS: BICALUTAMIDE 50MG
CERNOS	EACH SOFT GELATIN CAPSULE CONTAINS: TESTOSTERONE UNDECANOATE 40MG
CERNOS DEPOT INJ. 4ML	EACH ML CONTAINS: TESTOSTERONE UNDECANOATE 250MG (EQUIVALENT TO TESTOSTERONE 157.9MG) ONLY EXCIPIENTS Q.S.
CERNOS GEL	TESTOSTERONE USP 1% W/W, GEL BASE Q.S., ALSO CONTAINS 68.9% ETHANOL
DARILONG 7.5	EACH FILM COATED EXTENDED RELEASE TABLET CONTAINS: DARIFENACIN HYDROBROMIDE EQUIVALENT TO DARIFENACIN 7.5MG
DARILONG 15	EACH FILM COATED EXTENDED RELEASE TABLET CONTAINS: DARIFENACIN HYDROBROMIDE EQUIVALENT TO DARIFENACIN 15MG
DURALAST 30	EACH FILM COATED TABLET CONTAINS: DAPOXETINE HYDROCHLORIDE EQUIVALENT TO DAPOXETINE 30MG
DURALAST 60	EACH FILM COATED TABLET CONTAINS: DAPOXETINE HYDROCHLORIDE EQUIVALENT TO DAPOXETINE 60MG
LUPRIDE DEPOT 3.75MG INJ.	EACH VIAL CONTAINS: LEUPROLIDE ACETATE 3.75MG
LUPRIDE DEPOT 7.5MG (1 MONTH)	EACH VIAL CONTAINS: LEUPROLIDE ACETATE 7.5MG
LUPRIDE DEPOT 11.25MG (3 MONTHS)	EACH VIAL CONTAINS: LEUPROLIDE ACETATE 11.25MG
LUPRIDE DEPOT 22.50MG (3 MONTHS)	EACH VIAL CONTAINS: LEUPROLIDE ACETATE 22.50MG
MAXOZA L	EACH 5GM SACHET CONTAINS: AMINO ACIDS, VITAMINS AND MINERALS AND LYCOPENE POWDER
NAFTOMAX 50	EACH UNCOATED TABLET CONTAINS: NAFTOPIDIL 50MG
NAFTOMAX 75	EACH UNCOATED TABLET CONTAINS: NAFTOPIDIL 75MG
TAMDURA	EACH FILM COATED TABLET CONTAINS: TAMSULOSIN HYDROCHLORIDE (AS MODIFIED RELEASE) 0.4MG DUTASTERIDE 0.5MG

BRAND	COMPOSITION
TAMFLO 0.4	EACH CAPSULES CONTAINS: TAMSULOSIN HYDROCHLORIDE (AS MODIFIED RELEASE PELLETS) 0.4MG
TAMFLO 0.4 [New Formulation]	EACH CAPSULES CONTAINS: TAMSULOSIN HYDROCHLORIDE BP (AS MODIFIED RELEASE PELLETS) 0.4MG
TAMLET 2	EACH CAPSULES CONTAINS TAMSULOSIN HYDROCHLORIDE (AS MODIFIED RELEASE PELLETS) 2MG
TAMLET 4	EACH CAPSULES CONTAINS TAMSULOSIN HYDROCHLORIDE (AS MODIFIED RELEASE PELLETS) 0.4MG TOLTERODINE TARTRATE (AS EXTENDED RELEASE PELLETS) 4MG
TROFAME XR	EACH CAPSULES CONTAINS: TROSPiUM CHLORIDE BP (AS EXTENDED RELEASE PELLETS) 60MG
TROPAN 2.5	OXYBUTYNIN 2.5MG PER TAB
TROPAN 5	OXYBUTYNIN 5MG PER TAB
TROPAN-XL 5	EACH FILM COATED EXTENDED RELEASE TABLET CONTAINS: OXYBUTYNIN CHLORIDE USP 5MG
UROTEL-XL 2	EACH CAPSULE CONTAINS: TOLTERODINE TARTRATE 2MG
UROTEL-XL 4	EACH CAPSULE CONTAINS: TOLTERODINE TARTRATE 4MG

SECTION CONTENTS

● ACETAZOLAMIDE	2	● MESNA	14
● ALFUZOSIN	3	● METHENAMINE	14
● ALPROSTADIL	4	● MICONAZOLE	15
● BETHANECHOL CHLORIDE	4	● NYSTATIN	15
● BICALUTAMIDE	5	● OXYBUTYNIN	16
● CHLORAMPHENICOL	5	● PENICILLAMINE	17
● CLOTRIMAZOLE	6	● PHENAZOPYRIDINE	17
● COTRIMOXAZOLE	6	● PIPERACILLIN + TAZOBACTAM	18
● DARIFENACIN	7	● POVIDONE IODINE	18
● DISODIUM HYDROGEN CITRATE	7	● SILDENAFIL	19
● DOXAZOSIN	8	● SILODOSIN	20
● DUTASTERIDE	9	● Tadalafil	21
● FINASTERIDE	9	● TAMSULOSIN HYDROCHLORIDE	21
● FINASTERIDE + TAMSULOSIN	10	● TAMSULOSIN + DUTASTERIDE	22
● FLAVOXATE	10	● TERAZOSIN	22
● GENTAMICIN	11	● TESTOSTERONE	23
● HUMAN CHORIONIC GONADOTROPIN	12	● TOLTERODINE TARTRATE	24
● HYOSCINE BUTYL BROMIDE	13	● TROSPiUM CHLORIDE	25
● LEUPROLIDE ACETATE	13	● UROFOLLiTROPHiN	26

ACETAZOLAMIDE



Carbonic anhydrase inhibitor

INDICATIONS

To alkalinise the urine in UTI or to promote the excretion of certain acidic drugs.

MECHANISM OF ACTION

Inhibits carbonic anhydrase which catalyses the reaction involving hydration of CO_2 and de-hydration of carbonic acid. This causes secretion of aqueous humor and decrease in intra ocular pressure (IOP). In kidney this causes loss of HCO_3^- ion and along with that of Na^+ and K^+ .

DOSAGE

Oral: 250-375 mg once daily or on alternate days. Intermittent treatment is needed for continued efficacy.

CONTRAINdications

Liver disease may precipitate hepatic coma, renal hyper-

chloraemic acidosis, addison's disease, sensitivity to sulphonamides, pregnancy and lactation. Chronic angle-closure glaucoma.

ONSET OF EFFECT

Within 30 mins.

DURATION OF ACTION

6-24 hrs.

DRUG INTERACTIONS

- Oral anticoagulants, oral hypoglycaemics, mercurial diuretics: potentiated effects of these drugs.
- Quinidine: reduced quinidine excretion.
- Phenytoin: increased risk of osteomalacia.
- Cardiac glycosides: increased toxicity if hypokalaemia occurs with acetazolamide.
- Corticosteroids, sympatho-

mimetics, ulcercoating drugs: increased risk of hypokalaemia.

ADVERSE EFFECTS

Hypersensitivity, rash, tingling hands and feet, confusion, headache, lethargy, loss of appetite/weight loss, acidosis, hypokalaemia, abdominal dis-comfort, bone marrow depression, anorexia, paraesthesia, drowsiness, depression and renal calculi.

SPECIAL PRECAUTIONS

- Elderly; lactation; diabetes mellitus; pulmonary obstruction; monitor blood count and electrolytes if used for long periods; severe respiratory acidosis.
- May impair ability to perform skilled tasks, for example operating machinery, driving.

ALFUZOSIN



Alpha-1-adrenergic
receptor antagonist

INDICATIONS

Signs and symptoms of benign prostatic hyperplasia.

MECHANISM OF ACTION

Selectively blocks the post-synaptic alpha₁-adrenoreceptors, which are located in the prostate, bladder base, bladder neck, prostatic capsule, and prostatic urethra.

DOSAGE

10 mg once daily taken immediately after the same meal each day. Tablets should not be chewed or crushed.

CONTRAINDICATIONS

Moderate or severe hepatic impairment. Co-administration with potent CYP3A4 inhibitors (ketoconazole, itraconazole, ritonavir). Hypersensitivity to alfuzosin or any of the ingredients.

DRUG INTERACTIONS

- Potent CYP3A4 inhibitors such as ketoconazole, itraconazole, or ritonavir (alfuzosin blood levels are increased).
- Should not be used in combination with other alpha-blockers.
- Anti-hypertensive medication and nitrates (increased risk of hypotension/postural hypotension and syncope).

ADVERSE EFFECTS

Dizziness, upper respiratory infection, headache, fatigue. Angina pectoris in patients with pre-existing coronary artery disease, hepatocellular and cholestatic liver injury, priapism, angioedema.

SPECIAL PRECAUTIONS

- Care should be taken in patients with symptomatic hypotension or who have

had a hypotensive response to other medications or are concomitantly treated with antihypertensive medication or nitrates.

- Caution is advised in patients with severe renal impairment, and in patients with a history of QT prolongation or who are taking medications which prolong the QT interval.
- Prostate carcinoma should be ruled out prior to treatment.
- Intraoperative floppy iris syndrome (IFIS) during cataract surgery may require modifications to the surgical technique.
- Alfuzosin should be discontinued if symptoms of angina pectoris appear or worsen.

ALPROSTADIL



Prostaglandin E₁

INDICATIONS

Erectile dysfunction (ED).

MECHANISM OF ACTION

Vasodilation, inhibition of platelet aggregation, uterine and intestinal smooth muscle stimulation.

DOSAGE

0.05-0.1 mg/kg body wt. infusion per mins. 2.5-10 mg inj. for ED.

Dose should be individualized for each patient by careful titration under supervision. Lowest possible effective dose should be employed.

CONTRAINDICATIONS

Hypersensitivity to ingredients, hyaline membrane disease.

Patients having conditions that might predispose to priapism, such as sickle cell anemia or trait, multiple myeloma, or leukemia, or in patients with anatomical deformation of penis, such as angulation, cavernosal fibrosis, or Peyronie's disease, patients with penile implant, children and women.

DRUG INTERACTIONS

Anticoagulants (increased bleeding propensity).

ADVERSE EFFECTS

Flushing, bradycardia, hypotension, tachy-cardia, oedema, diarrhoea, fever, convulsions, DIC, cortical

proliferation of long bones, hypokalaemia, weakening of the wall of ductus arteriosus and pulmonary artery may follow prolonged use; gastric outlet obstruction.

SPECIAL PRECAUTIONS

- Caution in chronic obstructive pulmonary disease (COPD). Regular follow up of patients, with careful examination of penis, is strongly recommended to detect signs of penile fibrosis.
- Underlying treatable cause of erectile dysfunction should be diagnosed and treated prior to alprostadil treatment.

BETHANECHOL CHLORIDE



Choline ester

INDICATIONS

Acute post operative and post partum non obstructive (functional) urinary retention.

MECHANISM OF ACTION

It acts principally by providing the effects of stimulation of parasympathetic nervous system. It increases the tone of detrusor urinary muscle, usually producing a contraction sufficiently strong to initiate micturition and empty the bladder.

DOSAGE

10 to 25 mg taken three to

four times a day advisable to take on an empty stomach to reduce the risk of feeling sick.

CONTRAINDICATIONS

Children, pregnancy, lactation, elderly (over 70 years), blockage of gut, problems passing water due to a blockage, recent heart attack, recent surgery on stomach, hypersensitivity.

DRUG INTERACTIONS

- Medicines used to treat abnormal heart rhythms (e.g. quinidine and procainamide) other medicines used to

treat urinary retention (e.g. distigmine and carbachol).

- Medicines that are used to reduce high blood pressure in emergency situations (e.g. trimethaphan).

ADVERSE EFFECTS

Urinary urgency, vasomotor response, flushing, bronchial constriction, abdominal cramps and headache.

SPECIAL PRECAUTIONS

May interfere with an individual's ability to drive or operate machinery.

BICALUTAMIDE



Nonsteroidal antiandrogen

INDICATIONS

Advanced carcinoma of prostate in combination therapy with a lutenizing hormone releasing hormone (LHRH) analog.

MECHANISM OF ACTION

It competitively inhibits the action of androgens by binding to cytosol androgen receptors in the target tissue.

DOSAGE

50 mg once daily.

CONTRAINDICATIONS

- Hypersensitivity to drug or any component of the product.
- It has no indication in women.

DRUG INTERACTIONS

Coumarin anticoagulants: Increases the risk of bleeding by the displacement from protein binding sites.

ADVERSE EFFECTS

Hot flashes, diarrhoea, oedema, neoplasm, fever, neck pain, chills and sepsis.

SPECIAL PRECAUTIONS

Use cautiously in hepatic impairment (if transaminases increase over 2 times the upper limit of normal, discontinue the treatment).

CHLORAMPHENICOL



Broad spectrum antibiotic

INDICATIONS

Severe life-threatening infections, polynephritis (Use should be restricted for fear of toxicity and to avoid emergence of resistance, only when kidney substance is involved).

MECHANISM OF ACTION

Inhibits bacterial protein synthesis, prevents formation of peptide bonds (Primarily bacteriostatic, bactericidal at high concentrations).

DOSAGE

Oral, intramuscular or intravenous injection or infusion: 50 mg/kg body weight in four divided doses (can be doubled in very severe infections, reduce as soon as clinically indicated).

Daily dose not to exceed 2-3 g; duration of therapy to be less than 2-3 weeks.

CONTRAINDICATIONS

Pregnancy, porphyria, blood dyscrasias, preexisting

bone marrow depression, hypersensitivity, patients receiving radiation therapy.

DRUG INTERACTIONS

- Chloramphenicol Inhibits tolbutamide, chlorpropamide, warfarin, cyclophosphamide, and phenytoin metabolism.
- Phenobarbitone, phenytoin, rifampin enhance chloramphenicol metabolism.

ADVERSE EFFECTS

- Bone marrow depression-reversible and irreversible aplastic anaemia (with reports of leukaemia), anaemia, leukopenia and thrombocytopenia, nocturnal haemoglobinuria, peripheral neuritis and optic neuritis, nausea, vomiting, diarrhoea, dry mouth, stomatitis, glossitis, headache, depression.
- Hypersensitivity reactions including, rashes, fever, angioedema and rarely, anaphylaxis.

- Grey baby syndrome (vomiting, greenish diarrhoea, abdominal distension, hypothermia, pallid cyanosis, irregular respiration, circulatory collapse) may follow excessive doses in neonates with immature hepatic metabolism; also reported in infants born to mothers treated in late pregnancy; ocular irritation, angioneuretic edema.

SPECIAL PRECAUTIONS

- Avoid repeated courses and prolonged use; reduce dose in hepatic impairment and severe renal impairment; blood counts required before and during treatment.
- Monitor plasma concentrations in neonates.
- Lactation.
- Combined formulation of chloramphenicol with any drug is banned in India.

CLOTRIMAZOLE



Anti-fungal

INDICATIONS

Vulvovaginal candidiasis.

MECHANISM OF ACTION

Clotrimazole is a broad-spectrum antifungal which binds to phospholipids in the cell membrane altering cell wall permeability causing a loss in essential intracellular elements.

DOSAGE

Adult: Pessaries/vaginal tablets: 100 mg pessary/

vaginal tablet to be inserted into vagina at night before going to bed as deep as possible for consecutive 6 to 7 days or 200 mg for 3 consecutive nights before going to bed or 500 mg single dose.

Child: Pessaries/vaginal tablets: not recommended. Cream: Rub on affected area 2 to 3 times by applying in thin layer and rubbing, continue for 14 days after healing.

CONTRAINDICATIONS

Hypersensitivity.

ADVERSE EFFECTS

Erythema, stinging, irritation, hypersensitivity reactions; contact dermatitis.

SPECIAL PRECAUTIONS

- Avoid contact with eyes upon topical application.
- Children <3 yrs, pregnancy, lactation.

COTRIMOXAZOLE



Trimethoprim +
Sulphamethoxazole

INDICATIONS

Lower and upper urinary tract infections, prostatitis.

MECHANISM OF ACTION

Sequentially blocks folate metabolism in bacteria.

DOSAGE

Adult: 1 to 2 tablets twice daily for 7-14 days (160 + 800 mg).

Child: Suspension 5 ml twice daily (40 + 200 mg).

Infant: 2.5 ml.

CONTRAINDICATIONS

Hypersensitivity to sulphonamides or trimethoprim; porphyria; marked liver parenchymal damage, blood dyscrasias, severe renal insufficiency.

ADVERSE EFFECTS

Nausea, vomiting, diarrhoea,

headache; hypersensitivity reactions including rashes, pruritus, photosensitivity reactions, exfoliative dermatitis and erythema nodosum; rarely, erythema multiforme (Stevens-Johnson syndrome) and toxic epidermal necrolysis; systemic lupus erythematosus, myocarditis, serum sickness; crystalluria resulting in haematuria, oliguria, anuria; blood disorders including granulocytopenia, agranulocytosis, aplastic anaemia, purpura discontinue immediately; also reported, liver damage, pancreatitis, antibiotic-associated colitis, eosinophilia, cough and shortness of breath, pulmonary infiltrates, aseptic meningitis, depression, convulsions,

ataxia, tinnitus, vertigo, dizziness, hallucinations and electrolyte disturbances; megaloblastic anaemia due to trimethoprim; elevation of transaminase and bilirubin; skin rashes.

SPECIAL PRECAUTIONS

Renal impairment, hepatic impairment (avoid if severe), maintain adequate fluid intake (to avoid crystalluria), avoid in blood disorders (unless under specialist supervision), monitor blood counts and discontinue immediately if blood disorder develops, rash-discontinue immediately, predisposition to folate deficiency, asthma, G-6-PD deficiency, lactation, avoid in infants under 6 weeks, elderly, pregnancy.

DARIFENACIN



Muscarinic receptor antagonist

INDICATIONS

In adults with overactive bladder syndrome: (i) urge incontinence (sudden lack of control over urination); (ii) increased urinary frequency (need to urinate frequently); (iii) urgency (sudden urge to pass urine).

MECHANISM OF ACTION

Blocks muscarinic M3 receptor. Relaxes bladder muscles which push urine out, leading to an increase in bladder capacity. Thus helps to prevent unwanted urination.

DOSAGE

Starting dose is 7.5 mg once a day. Can be increased to 15 mg as early as two weeks after starting therapy for patients requiring greater symptom relief. Tablets to be swallowed whole with some liquid, and not to be chewed, divided or crushed.

CONTRAINdications

Urinary retention, gastric

retention, myasthenia gravis, severe liver problems, severe ulcerative colitis, toxic megacolon or uncontrolled narrow-angle glaucoma and in patients who are at risk for these conditions. Also contraindicated in known hypersensitivity to drug.

DRUG INTERACTIONS

- Daily dose not to exceed 7.5 mg when coadministered with potent CYP3A4 inhibitors such as ketoconazole, itraconazole, ritonavir, nelfinavir, clarithromycin and nefazadone.
- To be used with caution in concomitant use with medications having a narrow therapeutic window, such as flecainide, thioridazine and tricyclic antidepressants.
- Concomitant use with other anticholinergic agents may increase the frequency and/or severity of anticholinergic pharmacological effects.

ADVERSE EFFECTS

Abnormal vision, accidental injury, back pain, dry skin, flu syndrome, pain, hypertension, vomiting, peripheral edema, weight gain, arthralgia, bronchitis, pharyngitis, rhinitis, sinusitis, rash, pruritus, urinary tract disorder and vaginitis.

SPECIAL PRECAUTIONS

- Use with caution in patients with clinically significant bladder outflow obstruction, gastrointestinal obstructive disorders, and in patients with controlled narrow-angle glaucoma.
- Daily dose should not exceed 7.5 mg for patients with moderate hepatic impairment.
- Should be used during pregnancy only if the benefit to the mother outweighs the potential risk to the fetus. Should be used with caution in case of nursing women.

DISODIUM HYDROGEN CITRATE



Systemic alkaliiser

INDICATIONS

i) uraemic acidosis ii) renal tubular acidosis iii) burning micturition UTI.

MECHANISM OF ACTION

It alkalinizes the urine by its alkaline properties in urine.

DOSAGE

Adults: 15-30 ml BD/TID - (To be taken diluted in water).

Children: < 7 yr: upto 2 ml TID; 7-12 yrs: 5 ml TID—To be diluted in water and taken after meals.

CONTRAINDICATIONS

Patients on sodium restricted

diets, hypertension, oedema, severe renal impairment.

ONSET OF EFFECT

Within 1 hr.

DURATION OF ACTION

4-6 hrs.

DRUG INTERACTIONS

- Antacids containing aluminium: may cause severe interactions with them.
- Quinidine, amphetamine, ephedrine and pseudoephedrine: Increased half life of these drugs.

- Salicylates, barbiturates: enhanced elimination.

ADVERSE EFFECTS

Alkalosis, stomach cramps, flatulence.

SPECIAL PRECAUTIONS

Dilute adequately in water. Use cautiously in low urinary output impaired renal function, cardiac failure, hypertension and in pulmonary oedema. Monitor serum electrolytes. No special problem but the dose may have to be reduced in elderly. Caution in toxæmia of pregnancy.

INDICATIONS

Benign prostatic hyperplasia. Urinary outflow obstruction and obstructive and irritative symptoms associated with BPH: obstructive symptoms (hesitation, intermittency, dribbling, weak urinary stream, incomplete emptying of the bladder) and irritative symptoms (nocturia, daytime frequency, urgency, burning).

MECHANISM OF ACTION

Doxazosin competitively blocks the α_1 -adrenoceptors on postsynaptic effector cells in arteriolar and venous vascular beds resulting in vasodilation of veins and decrease in total peripheral resistance and BP.

DOSAGE

1–8 mg once daily. The initial dosage is 1 mg, given once daily in the a.m. or p.m. Depending on the individual patient's urodynamics and BPH symptomatology, dosage may then be increased to 2 mg and thereafter to 4 mg and 8 mg once daily, the maximum recommended dose for BPH. The recommended titration

interval is 1–2 weeks. Blood pressure should be evaluated routinely in these patients. If administration is discontinued for several days, therapy should be restarted using the initial dosing regimen. Dosage must be individualized.

ONSET OF EFFECT

2–6 hr (oral).

DURATION OF ACTION

24 hr.

CONTRAINDICATIONS

Known sensitivity to quinazolines (e.g., prazosin, terazosin).

DRUG INTERACTIONS

Decreased hypotensive effect with NSAIDs. Increased hypotensive effect with β -blockers, diuretics, ACE inhibitors, calcium-channel blockers.

ADVERSE EFFECTS

Dizziness, fatigue, hypotension, edema, and dyspnea.

SPECIAL PRECAUTIONS

- Renal or hepatic impairment.
- Prostatic carcinoma should be ruled out before starting therapy (cataract surgery).

- Orthostatic hypotension may occur at the initiation of therapy or when there is dose increase.
- Avoid driving or performing hazardous tasks for 24 hr after starting therapy or dose changes.
- Pregnancy and lactation.
- Syncope and "First-dose" Effect: There might be marked hypotension, especially in the upright position, with syncope and other postural symptoms such as dizziness. Marked orthostatic effects are most common with the first dose but can also occur when there is a dosage increase, or if therapy is interrupted for more than a few days. To decrease the likelihood of excessive hypotension and syncope, it is essential that treatment be initiated with the 1 mg dose. Dosage should then be adjusted slowly.
- Alcohol should not be taken during drug intake.

DUTASTERIDE



5-alpha reductase inhibitor

INDICATIONS

Symptomatic benign prostatic hyperplasia (BPH) in men with an enlarged prostate to; improve symptoms, reduce the risk of acute urinary retention, and reduce the risk of the need for BPH-related surgery.

MECHANISM OF ACTION

Dutasteride is a dual 5-alpha-reductase inhibitor, blocking both type I and type II 5-alpha-reductase isoenzymes. These enzymes are responsible for converting testosterone into dihydrotestosterone (DHT) in the prostate. In turn, high levels of DTH may accumulate and cause hyperplasia.

DOSAGE

Monotherapy: 0.5 mg once daily.

Combination with alpha adrenergic blocker: 0.5 mg once daily and 0.4 mg once daily respectively

CONTRAINDICATIONS

- Pregnancy and women of childbearing potential.
- Pediatric patients.
- Patients with previously demonstrated, clinically significant hypersensitivity.

DRUG INTERACTIONS

Use with caution in patients taking potent, chronic CYP3A4 enzyme inhibitors (e.g., ritonavir).

ADVERSE EFFECTS

Impotence, decreased libido, ejaculation disorders, and breast enlargement and tenderness.

SPECIAL PRECAUTIONS

- Dutasteride reduces serum prostate-specific antigen (PSA) concentration by approximately 50%. Any confirmed increase in PSA while on dutasteride may signal the presence of prostate cancer and should be evaluated, even if those values are still within the normal range for untreated men.
- Patients should be assessed to rule out other urological diseases, including prostate cancer, prior to prescribing dutasteride.
- Patients should not donate blood until 6 months after their last dose of dutasteride.

FINASTERIDE



5-alpha reductase inhibitor

INDICATIONS

Benign prostatic hyperplasia.

MECHANISM OF ACTION

Finasteride is a competitive inhibitor of the enzyme 5-a reductase which converts testosterone to dihydrotestosterone (DHT).

DOSAGE

The recommended dosage is 1 mg orally once a day. It may be administered with or without meals. In general, daily use for three months or more

is necessary before benefit is observed. Continued use is recommended to sustain benefit, which should be re-evaluated periodically.

Withdrawal of treatment leads to reversal of effect within 12 months.

CONTRAINDICATIONS

- Children.
- Pregnancy (any exposure to finasteride is dangerous for fetus).
- Hypersensitivity.

ADVERSE EFFECTS

Gynaecomastia, decreased libido, impotence, reduction in the volume of ejaculate, testicular pain. Hypersensitivity reactions e.g. swelling of lips and face, urticaria, rashes.

SPECIAL PRECAUTIONS

- Undiagnosed prostate cancer, liver dysfunction, obstructive uropathy.
- Women should not handle crushed or broken finasteride tablets.

FINASTERIDE + TAMSULOSIN



5-alpha reductase inhibitor +
alpha-1 antagonist

INDICATIONS

Benign prostatic hyperplasia.

DOSAGE

Oral: Adult: 1 cap once daily (each cap contains finasteride 5 mg and tamsulosin 0.4 mg).

CONTRAINDICATIONS

Hypersensitivity, pregnancy, lactation, women and children.

DRUG INTERACTIONS

- Caution when used with cimetidine or warfarin.
- Not to be used with other alpha-adrenergic blocking agents.

ADVERSE EFFECTS

- Gynecomastia, decreased libido, impotence, reduction in the volume of ejaculate, genital abnormalities in the male foetus of pregnant women exposed to finasteride.
- Hypersensitivity reactions such as swelling of lips and rashes, postural hypotension, dizziness and vertigo.
- Headache, infection, asthenia, back pain, chest pain, dizziness, somnolence, insomnia, rhinitis, pharyngitis, cough, sinusitis, diarrhoea,

nausea, tooth disorder, amblyopia.

SPECIAL PRECAUTIONS

- Avoid exposure of pregnant women to finasteride, either via direct contact with crushed tab or through semen of male sexual partners who are on this drug.
- Undiagnosed prostate cancer, liver diseases.
- Prostate carcinoma should be ruled out before starting the therapy.

FLAVOXATE



Tertiary amine

INDICATIONS

- Symptomatic relief of dysuria
- urgency
- nocturia
- suprapubic pain
- frequency and incontinence as may occur in cystitis, prostatitis, urethritis, urethrocystitis/urethrotrigonitis.
- bladder spasm due to catheterization.

MECHANISM OF ACTION

It counteracts smooth muscle spasm of the urinary tract by cholinergic blockade and direct effect on the muscles.

DOSAGE

100-200 mg TID to QID. Taken before or after meals.

CONTRAINDICATIONS

Pyloric/duodenal/intestinal obstruction, achalasia, GI haemorrhage, obstructive uropathy of the lower urinary tract.

ONSET OF EFFECT

Within 2 hrs.

DURATION OF ACTION

6-8 hrs.

ADVERSE EFFECTS

Drowsiness, lethargy, dry mouth, nausea, vomiting, headache, confusion and blurred vision.

SPECIAL PRECAUTIONS

- Use cautiously in glaucoma, prostate hypertrophy, GI disease and in other medications.
- Not recommended in age below 12 yrs.

**INDICATIONS**

Pelvic inflammatory disease, *Pseudomonas*, *Proteus* or *Klebsiella* infection.

MECHANISM OF ACTION

Bactericidal by inhibiting protein synthesis.

DOSAGE

Intravenous infusion: Once daily dose regime; 5 to 7 mg/kg body weight, then adjust as per serum gentamicin concentration.

Intramuscular or slow intravenous injection: Over at least 3 min

Multiple daily dose regimen: 3 mg/kg body weight divided into 8 hly doses.

Child: 2 weeks to 12 yrs: 2 mg/kg body weight 8 hly.

The daily dose should be reduced in patients with impaired renal

function according to measured creatinine clearance.

CONTRAINdications

Myasthenia gravis, drug hypersensitivity.

DRUG INTERACTIONS

Concurrent use with following drugs should be avoided: high ceiling diuretics, minocycline, amphotericin B, vancomycin, cephalothin, cyclosporine, cisplatin, muscle relaxant drugs.

ADVERSE EFFECTS

Vestibular & auditory damage, nephrotoxicity; hypomagnesaemia on prolonged therapy; antibiotic-associated colitis, also nausea, vomiting, rash; bacterial/fungal corneal ulcers, ocular burning or irritation, thrombocytopenia, joint pain.

SPECIAL PRECAUTIONS

- Renal impairment, infants and elderly (dosage adjustment and monitor renal, auditory and vestibular function and serum-gentamicin concentrations).
- Avoid prolonged use; conditions characterized by muscular weakness; significant obesity (monitor serum-gentamicin concentration closely and possibly reduce dose); purulent discharge, discontinue if pain/inflammation becomes aggravated; pregnancy.
- It should not be mixed with any drug in the same syringe or bottle.

HUMAN CHORIONIC GONADOTROPIN



Gonadotropic hormone

INDICATIONS

In young boys undescended testes.

MECHANISM OF ACTION

It is a placental hormone with alpha/beta subunits. Alpha subunit is similar to LH, FSH and TSH. HCG stimulates production of gonadal steroids by stimulating Leydig cells to produce androgens & corpus luteum to produce progesterone.

DOSAGE

- Prepubertal cryptorchidism not due to anatomical obstruction : for IM use only. Therapy is instituted between 6 and 9 years. The different regimens are : (1) 4000 USP units 3 times weekly for 3 weeks. (2) 5000 USP units every second day for 4 injections. (3) 15 injections of 500 to 1000 USP units over

a period of 6 weeks. (4) 500 USP units 3 times weekly for 4-6 weeks. If this course of treatment is not successful, another series of 1000 USP units per injection is given one month later.

- Selected cases of hypogonadotropic hypogonadism in males : the different regimens are : (1) 500 to 1000 USP units 3 times a week for 3 weeks, followed by the same dose twice a week for 3 weeks. (2) 4000 USP units 3 times a week for 6-9 months, following which the dosage may be reduced to 2000 USP units 3 times weekly for an additional 3 months.
- Induction of ovulation and pregnancy, in the anovulatory, infertile women in whom the cause of anovulation is secondary and not due to primary ovarian disorder.

CONTRAINDICATIONS

Hypersensitivity, precocious puberty, prostatic carcinoma and other androgenic dependent neoplasm.

DRUG INTERACTIONS

No known interactions.

ADVERSE EFFECTS

Headache/tiredness, mood changes, gynaecomastia, peripheral oedema, depression, aggressive behaviour, arterial thromboembolism and pain at injection site.

SPECIAL PRECAUTIONS

- Use cautiously in chronic hepatic/renal dysfunction, asthma, epileptic fits, migraine, cardiac disorder, prostate symptoms and in other medications.
- Males: regular sperm counts is needed.
- Concomitant alcohol use may reduce fertility.

HYOSCINE BUTYL BROMIDE



Anticholinergic
antispasmodic

INDICATIONS

Spasm of the urinary tract, delayed relaxation of the lower uterine segment.

MECHANISM OF ACTION

It has a special site of action at the parasympathetic ganglia in the walls of the viscera, which exerts a specific antispasmodic action on the smooth muscle of the gastro-intestinal, biliary and urinary tracts.

DOSAGE

10-20 mg 3-5 times daily.

CONTRAINDICATIONS

Glaucoma, retention of urine (prostate hypertrophy).

Mechanical stenoses in the region of GIT, tachycardia, megacolon.

DRUG INTERACTIONS

Effects potentiated by other anti cholinergic drugs and tricyclic antidepressants. Absorption of concomitantly administered oral drug is delayed.

ADVERSE EFFECTS

- Dryness of mouth, tachycardia, blurring of vision, drowsiness.
- Eye drops: prolonged use may lead to irritation, hyperaemia, oedema and conjunctivitis, increase in intra-ocular pressure may occur especially in patients with closed angle glaucoma. Occasionally psychotic reactions.

intra-ocular pressure may occur especially in patients with closed angle glaucoma. Occasionally psychotic reactions.

- Transdermal delivery system: Bilateral mydriasis, contamination of finger and rubbing of eye may result in unilateral fixed dilatation of pupil, glaucoma, contact dermatitis, psychotic reactions. Nausea and dizziness after removal.

SPECIAL PRECAUTIONS

Use cautiously while driving, in elderly, hepatic/renal disease, pregnancy and lactation.

LEUPROLIDE ACETATE



Long-acting GnRH analog

INDICATIONS

Palliative treatment of advanced prostate cancer.

MECHANISM OF ACTION

It is a long-acting GnRH analog. When given continuously, inhibits pituitary gonadotropin secretion and suppresses testicular steroidogenesis.

DOSAGE:

7.5 mg in one injection every month subcutaneously.

CONTRAINDICATIONS

Hypersensitivity, women, children.

DRUG INTERACTIONS

No pharmacokinetic-based drug-drug interaction studies have been conducted.

ADVERSE EFFECTS

Sweating, insomnia, syncope, flatulence, constipation, decreased RBC count, weight gain, backache, joint pain, decreased bone density, impotence, testicular soreness.

SPECIAL PRECAUTIONS

- Urinary tract obstruction should be closely observed during first few weeks of therapy.
- If spinal cord compression or renal impairment develops, standard treatment of these complications should be instituted.

MESNA



Sulphydryl donor and uroprotective agent

INDICATIONS

Prophylactic agent in reducing the incidence of ifosfamide-induced hemorrhagic cystitis.

MECHANISM OF ACTION

Mesna is rapidly oxidized to its major metabolite, mesna disulfide (dimesna). In the kidney, the mesna disulfide is reduced to the free thiol compound, mesna, which reacts chemically with the urotoxic ifosfamide metabolites (acrolein and 4-hydroxy-ifosfamide) resulting in their detoxification.

DOSAGE

Patients receiving IV ifosfamide at a dosage of 1.2 g/m²: The

recommended dosage of mesna is 240 mg/m² given IV 15 minutes before or at the time of administration of the ifosfamide dose, followed by 240 mg/m² of mesna IV at 4 and 8 hours after the ifosfamide dose.

CONTRAINDICATIONS

Known hypersensitivity to mesna or other thiol compounds.

ADVERSE EFFECTS

Headache, injection site reactions, flushing, dizziness, nausea, vomiting, somnolence, diarrhea, anorexia, fever, pharyngitis, hyperesthesia, influenza-like symptoms, and coughing.

SPECIAL PRECAUTIONS

- Patients receiving mesna should be instructed to notify the clinician if discoloration of urine occurs.
- Mesna injection containing benzyl alcohol as a preservative should not be used in neonates and infants and should be used with caution in children and adolescents.
- The drug should be used during pregnancy only when clearly needed.

METHENAMINE



Hexamethylene tetramine

INDICATIONS

Prophylaxis and long term treatment of recurrent UTI.

MECHANISM OF ACTION

In acid environment, it is hydrolysed to ammonia and formaldehyde, which is bactericidal.

DOSAGE

Adults: 1 gm QID - min. 30 days; Children: 500 mg QID for more than 6 yrs; 15 mg/kg for < 6yrs. to be taken after meals.

CONTRAINDICATIONS

- Renal failure (may cause acidosis), liver disease, dehydration, metabolic acidosis.
- It should not be used as the sole therapeutic agent in acute parenchymal

infections causing systemic symptoms.

ONSET OF EFFECT

- Within 2 hrs (methenamine hippurate).
- Within 3-8 hrs (methenamine mandelate).

DRUG INTERACTIONS

- Sulphonamides: antagonism and crystalluria (due to precipitation).
- Alkalising agents, antacids, potassium citrate, acetazolamide: reduced methenamine effective-ness.

ADVERSE EFFECTS

Gastritis, chemical cystitis, nausea/vomiting, dyspepsia, proteinuria, haematuria, CNS symptoms, painful and frequent micturition.

SPECIAL PRECAUTIONS

- Do not prescribe in the absence of a proven or strongly suspected bacterial infection.
- Large doses of methenamine (8 g daily for 3 to 4 weeks) may cause bladder irritation, painful and frequent micturition, albuminuria, and gross hematuria.
- Care should be taken to maintain an acid pH of the urine especially when treating infections due to urea-splitting organisms such as *Proteus spp.* and strains of *Pseudomonas spp.*

MICONAZOLE



Antifungal
(Imidazole derivative)

INDICATIONS

Vulvo vaginal candidiasis and *Tinea* infections.

MECHANISM OF ACTION

It is an imidazole derivative antifungal agent acting topically on skin/mucus membrane. Effective against trichophyton, microsporum, epidermophyton, candida, cryptococcus and coccidiomycosis.

DOSAGE

Vulvovaginal candidiasis: 100 mg suppository at bedtime for

7 days OR 200 mg suppository at bedtime for 3 days.

Topical: Apply on affected areas twice daily for 7 days. Repeat the course if necessary.

CONTRAINDICATION

Hypersensitivity.

ADVERSE EFFECTS

Pruritus, rash, GI upsets, haematological abnormalities, fever/chills, drowsiness, flushing, anaphylaxis, vaginal irritation and pelvic cramps.

SPECIAL PRECAUTIONS

- Monitor haematocrit, Hb, electrolytes and lipids during systemic treatment.
- Not recommended in age below 1 yr.
- Pregnancy and elderly.
- Contact with eyes and mucous membranes should be avoided.

NYSTATIN



Tetraene antifungal macrolide

INDICATIONS

Candida (monilia) albicans infections.

MECHANISM OF ACTION

Topical antifungal.

DOSAGE

Oral: Adult: Intestinal candidiasis: 5,00,000 units every six h, doubled in severe infections.

Child: 1 month to 12 years: 1,00,000 units 4 times daily, immunocompromised children may require higher doses up to 5,00,000 units.

Topical application: Dissolve one tablet in glycerine and apply locally 3 to 4 times.

Intravaginal: Insert one tablet deep into vagina before bed time once at night.

CONTRAINDICATIONS

Hypersensitivity reactions.

ONSET OF EFFECT

Full beneficial effect may not be felt for 7-14 days.

DURATION OF ACTION

Upto 6 hrs.

DRUG INTERACTIONS

No known interactions.

ADVERSE EFFECTS

Nausea, vomiting, diarrhoea at high doses; oral irritation and sensitization; rash and rarely, erythema multiforme (Steven's-Johnson syndrome); eczema, burning.

SPECIAL PRECAUTIONS

- Lactation and pregnancy; discontinue if sensitivity develops.
- Should not be used for the treatment of systemic, oral, intravaginal or ophthalmic infections.

**INDICATIONS**

Overactive bladder with symptoms of urge urinary incontinence, urgency, and frequency.

Pediatric patients aged 6 years and older with symptoms of detrusor overactivity associated with a neurological condition (e.g., spina bifida).

MECHANISM OF ACTION

It inhibits muscarinic action of ACh on smooth muscles to relieve spasm.

DOSAGE

Usually PO 5mg BID/TID/QID. Titrate dosage to maximum response with minimum adverse effects.

Elderly: a lower starting dose, eg 2.5 mg BID/TID or 3-5 mg BID.

Children more than 5 yrs- for neurogenic bladder/enuresis: 2.5 mg BD, increased to max of 5 mg TID.

CONTRAINDICATIONS

Untreated angle closure glaucoma/narrow anterior chamber angles, obstruction of the bowel, bladder outflow obstruction (precipitation of urinary retention may occur), intestinal atony, severe ulcerative colitis, myasthenia gravis.

DRUG INTERACTIONS

Increased anticholinergic side effects with atropinic drugs.

ADVERSE EFFECTS

Atropine-like symptoms including dry mouth, constipation, drowsiness, blurred vision, Reflux oesophagitis, hypotension, heat stroke (in excessively hot temperature).

SPECIAL PRECAUTIONS

- Patients should be monitored for signs of anticholinergic CNS effects, particularly in the first few months after beginning treatment or

increasing the dose. If a patient experiences anticholinergic CNS effects, dose reduction or drug discontinuation should be considered.

- Should be used with caution in patients with preexisting dementia treated with cholinesterase inhibitors, hepatic or renal impairment, myasthenia gravis, bladder outflow obstruction, GI obstructive diseases, and with GERD.
- Patients should be advised to promptly discontinue oxybutynin therapy and seek immediate medical attention if they experience edema of the tongue, edema of the laryngopharynx, or difficulty breathing.

PENICILLAMINE



NR



!



Chelating agent

INDICATIONS

Cystine calculi; in cystinuria (along with conventional therapy), prophylaxis of cystine.

MECHANISM OF ACTION

Interacts with cystine to form penicillamine-cystine mixed disulfide.

DOSAGE

- Adult: 1-4g daily in 4 divided dose. Usual doses: 2 g/day. If 4 equal doses are not possible, give largest dose at bedtime. Doses adjusted to limit cystine excretion to 100-200 mg/day (<100mg/day with history of stone formation). Patients should receive pyridoxine supplementation 25 mg/day.
- If adverse reactions necessitate a reduction in dosage, it is important to retain the bedtime dose.
- Initiating dosage with 250 mg per day, and increasing gradually to requisite amount, gives closer control of the effects of drug and may help to reduce incidence of adverse reactions.

CONTRAINDICATIONS

- Pregnancy: Except in certain cases of cystinuria or Wilson's disease.
- History of penicillamine-related aplastic anemia or agranulocytosis. Rheumatoid arthritis patients with a history or other evidence of renal insufficiency.
- Penicillamine should not be used in patients who are receiving concurrent gold therapy, antimalaria or cytotoxic drugs, oxyphenbutazone or phenylbutazone because of similar serious hematologic and renal outcome.

ADVERSE EFFECTS

Initially nausea (less of a problem if taken before food or on retiring; and if initial dose is only gradually increased); anorexia; fever; taste loss (mineral supplements not recommended); blood disorders including thrombocytopenia; neutropenia; agranulocytosis and aplasticaemia; proteinuria; rarely, haematuria (withdraw immediately); haemolytic anaemia; nephrotic syndrome; lupus erythematosuslike

syndrome; myasthenia-like syndrome; polymyositis (rarely, with cardiac involvement); dermatomyositis; mouth ulcers; stomatitis; alopecia; bronchiolitis and pneumonitis; pemphigus; glomerulonephritis (Goodpasture syndrome) and erythema multiforme (Stevens-Johnson syndrome); male and female breast enlargement; rash (early rash disappears on withdrawing treatment-reintroduce at lower dose and increase gradually; late rash is more resistant either reduce dose or withdraw treatment).

SPECIAL PRECAUTIONS

- Pregnancy, lactation.
- Patients should be advised to increase the fluid intake.
- Pyridoxine supplementation should be given during therapy.
- Risks of continued therapy in patients manifesting potentially serious urinary abnormalities must be weighed against the expected therapeutic outcomes.
- An annual X-ray for renal stones is advised, when penicillamine is used in cystinuria.

PHENAZOPYRIDINE



x



x



Azodye (Analgesic)

INDICATIONS

Relief of urinary tract pain associated with infection.

MECHANISM OF ACTION

It exerts analgesic effect in urinary tract.

DOSAGE

100-400 mg TID, after meals.

CONTRAINDICATIONS

Renal impairment, hepatic dysfunction, uraemia and hypersensitivity.

ADVERSE EFFECTS

Abdominal discomfort, epigastric pain, nausea, headache, rashes, haemolytic anaemia,

methaemoglobinemia, staining of contact lenses.

SPECIAL PRECAUTIONS

- The urine colour changes to orange-red.
- Avoid prolonged use.

PIPERACILLIN + TAZOBACTAM



Extended spectrum penicillin + β lactamase inhibitor

INDICATIONS

Urinary tract infection (only in serious pseudomonal infections)

MECHANISM OF ACTION

Bactericidal by inhibiting cell wall synthesis in bacteria.

DOSAGE

4.5 g (Piperacillin 4g + Tazobactam 0.5g) every 6 h for 7-14 days.

CONTRAINDICATION

Hypersensitivity to penicillins.

DRUG INTERACTION

- Aminoglycosides (Inactivation of aminoglycosides).
- Methotrexate (Reduced clearance of methotrexate).

ADVERSE EFFECTS

Hypersensitivity reactions like rash, fever, bronchospasm,

vasculitis, serum sickness, exfoliative dermatitis, Steven's-Johnson syndrome, and anaphylaxis.

SPECIAL PRECAUTIONS

- Pregnancy.
- Lactation.
- prolonged treatment may increase super infections.

POVIDONE IODINE



Iodophore antiseptic

INDICATIONS

Antiseptic; skin disinfection.

MECHANISM OF ACTION

Soluble complex of iodine with large molecular organic compound, releases iodine slowly and exerts prolonged germicidal action.

DOSAGE

- *Adult and Child-Pre- and post-operative skin disinfection:* Apply undiluted.
- Antiseptic (minor wounds and burns): apply twice daily.

CONTRAINDICATIONS

- Avoid regular or prolonged use in patients with thyroid disorders or those taking lithium.
- Avoid regular use in neonates.
- Avoid in very low birthweight infants; burn covering large surface area.
- Hypersensitivity to iodine.

ADVERSE EFFECTS

Irritation of skin and mucous membranes; may interfere with thyroid function tests,

metabolic acidosis, renal impairment.

SPECIAL PRECAUTIONS

- Pregnancy, lactation, broken skin, renal impairment, neonates.
- The application of povidone iodine to large wounds or severe burns may produce systemic adverse effects such as metabolic acidosis; hypernatraemia; and impairment of renal function.
- Avoid contact with eyes.

SILDENAFIL



PDE-5 inhibitor

INDICATIONS

Erectile dysfunction.

DOSAGE

Oral: Adult: 50mg about 1 hr before sexual intercourse. May adjust dose depending on penile response. Max: 100 mg/dose and not to be taken > once in 24 hrs.

Elderly: >65 yr: Lower initial dose at 25 mg.

CONTRAINDICATIONS

Hypersensitivity. Patients concurrently or intermittently using organic nitrates in any form.

DRUG INTERACTIONS

• Inhibitors of CYP3A4 such as cimetidine & erythromycin are likely to reduce sildenafil clearance. CYP3A4 inducers such as rifampicin may decrease

the plasma concentrations of sildenafil. Symptomatic hypotension when used with alpha-blockers.

- Plasma concentrations are increased by ritonavir.
- May potentiate hypoensive effects of organic nitrates & nifedipine.

ADVERSE EFFECTS

Headache, flushing, respiratory tract infection, angina pectoris, AV block, migraine, syncope, tachycardia, postural hypotension, MI, cerebral thrombosis, cardiac arrest, paraesthesia, tremor, depression, herpes simplex, skin ulcer, oesophagitis, abnormal LFT, rectal haemorrhage, hypoglycaemic reaction, arthritis, deafness, retinal vascular disease, photosensitivity, accidental fall.

SPECIAL PRECAUTIONS

- Caution when used in patients with anatomical deformation of penis or conditions that may predispose them to priapism (e.g. sickle cell anaemia, myeloma, or leukaemia).
- Mild, transient, dose-related impairment of colour discrimination (blue/green) may occur. hepatic or severe renal impairment, bleeding disorders, active peptic ulceration, hypotension, recent history of stroke, MI, arrhythmias, unstable angina, heart failure or retinal disorders. May cause sudden loss or decrease in hearing.

**INDICATIONS**

To treat the symptoms of benign prostatic hyperplasia (BPH), including difficulty urinating (hesitation, dribbling, weak stream, and incomplete bladder emptying), painful urination, and urinary frequency and urgency.

MECHANISM OF ACTION

Blocks alpha-1A adreno-receptors in the prostate gland, the bladder and the urethra, and allows these muscles to relax, making it easier to pass urine and relieving the symptoms of BPH.

DOSAGE

Starting dose is 4 mg once a day for men with moderate kidney problems. Can be increased to 8 mg once a day after a week. Should be taken with food, preferably at the same time every day.

CONTRAINDICATIONS

- Severe renal impairment [Creatinine Clearance (CCr < 30 mL/min)].
- Severe hepatic impairment (Child-Pugh score > 10).
- Concomitant administration with strong CYP3A4 inhibitors (e.g., ketoconazole, clarithromycin, itraconazole, ritonavir).

DRUG INTERACTIONS

- Concomitant use of strong P-glycoprotein inhibitors (e.g., cyclosporine) and alpha blockers is not recommended.
- Concomitant use of PDE5 inhibitors can potentially cause symptomatic hypotension.

ADVERSE EFFECT

Most common adverse reactions (incidence $\geq 2\%$) are retrograde ejaculation, dizziness, diarrhea, orthostatic hypotension, headache,

nasopharyngitis, and nasal congestion.

SPECIAL PRECAUTIONS

- Postural hypotension, with or without symptoms (e.g., dizziness), may develop when beginning silodosin treatment.
- Dose should be reduced to 4 mg once daily in patients with moderate renal impairment.
- Patients should be examined thought to have BPH prior to starting therapy to rule out the presence of carcinoma of the prostate.
- Patients should be informed planning cataract surgery to notify their ophthalmologist that they are taking silodosin because of the possibility of intraoperative floppy iris syndrome (IFIS).

Tadalafil



PDE-5 inhibitor

INDICATIONS

Erectile dysfunction.

DOSAGE

Oral: Adult: Initially, 10 mg at least 30 minutes before sexual activity once daily, up to 20 mg as single dose. Max: not more than once daily. If used with potent inhibitors of CYP3A4, e.g. azole antifungals or protease inhibitors: max 10 mg once every 72 hr.

CONTRAINDICATIONS

- Concurrent use of organic nitrates, nitrates and nitric oxide donors.
- Men with cardiac disease for whom sexual activity is inadvisable.
- Recent MI (within 90 days) or stroke (within last 6 months), hypotension (<90/50 mmHg), unstable angina, heart failure, uncontrolled arrhythmias or hypertension.

DRUG INTERACTIONS

Increased risk of hypotension with alpha-blockers; increased risk of priapism with other drugs for erectile dysfunction, e.g., alprostadil; increased heart rate with theophylline; decreased tadalafil serum conc. with CYP3A4 inducers e.g. rifampicin, efavirenz, carbamazepine, nevirapine, barbiturates, phenobarbital, phenytoin, ribabutin; increased tadalafil serum conc with CYP3A4 inhibitors e.g. azole antifungals, protease inhibitors, cimetidine, macrolides. Enhanced hypotensive effect with nitrates and nicorandil.

ADVERSE EFFECTS

Headache, dyspepsia, dizziness, flushing, swelling of eyelids, eye pain, conjunctival hyperemia, back pain, myalgia, visual disturbances, nasal

congestion, sudden decrease or loss of hearing, tinnitus. Stevens-Johnson syndrome, exfoliative dermatitis, severe CV events e.g. MI, stroke, sudden cardiac death.

SPECIAL PRECAUTIONS

- Hepatic or renal impairment, CV disease, anatomical penile deformation, predisposition to priapism, child <18 years.
- Discontinue and seek medical advice if there is sudden vision loss or decreased vision in one or both eyes or tinnitus, dizziness or sudden loss or decrease in hearing, while taking Tadalafil.
- Seek immediate medical advice if erection lasts > 4 hrs.

Tamsulosin Hydrochloride



Alpha-1 antagonist

INDICATIONS

Benign prostatic hyperplasia (BPH).

MECHANISM OF ACTION

Blocks alpha 1 adrenoreceptor abundant in prostate, prostatic capsule, prostatic urethra, and bladder neck. It causes smooth muscles in the bladder neck and prostate to relax, resulting in an improvement in urine flow rate and a reduction in symptoms of BPH.

DOSAGE

0.4 mg once daily. For those who do not respond after two or four weeks, dose can

be increased to 0.8 mg once daily.

CONTRAINDICATIONS

Hypersensitivity to the drug, in severely impaired hepatic function and severely impaired kidney functions.

DRUG INTERACTIONS

Caution is advised using with alpha adrenergic blocking agents, cimetidine, warfarin.

ADVERSE EFFECTS

Headache, infection, asthenia, back pain, dizziness, insomnia, rhinitis, cough, sinusitis, nausea and abnormal ejaculation.

SPECIAL PRECAUTIONS

- Prostate carcinoma should be ruled out before starting the therapy.
- Patients should be cautioned about driving, operating machinery or performing hazardous tasks, or the possibility of priapism (though very rare).
- Patients should be informed that if priapism happens, it should be brought to immediate medical attention to avoid risk of permanent damage.

TAMSULOSIN + DUTASTERIDE



Alpha-1 antagonist +
5-alpha reductase inhibitor

INDICATIONS

Benign prostatic hyperplasia.

DOSAGE

Oral: Adult: 1 tab once daily (each tab contains tamsulosin 0.4mg and dutasteride 0.5mg).

CONTRAINDICATIONS

Hypersensitivity, severe liver impairment, pregnancy, lactation, child and adolescent.

DRUG INTERACTIONS

Comcomitant administration with moderate or strong inhibitors of CYP2D6 (eg. fluoxetine) or CYP3A4 (eg. ketoconazole, cimetidine)

increases tamsulosin serum concentration; increase in blood concentrations of dutasteride in the presence of inhibitors of CYP3A4/5 such as ritonavir, ketoconazole, verapamil, diltiazem, cimetidine, troleandomycin and ciprofloxacin.

ADVERSE EFFECTS

Impotence, decreased libido, ejaculation disorders, breast tenderness and enlargement, postural hypotension, dizziness and vertigo, headache, infection, asthenia, back pain, chest pain, somnolence, insomnia, rhinitis, pharyngitis,

cough, sinusitis, diarrhoea, nausea, tooth disorder, blurred vision.

SPECIAL PRECAUTIONS

- Excretion in semen therefore use of condom is recommended. Women of childbearing potential should avoid handling leaking cap of dutasteride.
- Prostate carcinoma should be ruled out before starting the therapy.
- Blood donation to be avoided during and at least 6 months after discontinuance of drug.

TERAZOSIN



Alpha adrenoceptor blocking agent

INDICATIONS

Benign prostatic hyperplasia.

MECHANISM OF ACTION

It relaxes smooth muscle produced by blockade of alpha-1 adrenoceptors in the bladder neck and prostate. Because there are relatively few alpha-1 adrenoceptors in the bladder body, terazosin is able to reduce the bladder outlet obstruction without affecting bladder contractility.

DOSAGE

- Initial dose:** 1 mg at bedtime (should not be exceeded as an initial dose): Patients should be closely followed during initial administration in order to minimize the risk of severe hypotensive response.
- Subsequent doses:** The dose should be increased in a stepwise fashion to

2 mg, 5 mg, or 10 mg once daily to achieve the desired improvement of symptoms and/or flow rates.

- Doses of 10 mg once daily are generally required for the clinical response. Therefore, treatment with 10 mg for a minimum of 4–6 weeks may be required to assess whether a beneficial response has been achieved.

CONTRAINDICATIONS

Hypersensitivity.

DRUG INTERACTIONS

- Other antihypertensive agents, especially the calcium channel blocker verapamil: possibility of developing significant hypotension.
- Other PDE-5 inhibitor can result in additive blood pressure lowering effects & symptomatic hypotension.

ADVERSE EFFECTS

Dizziness, drowsiness, fatigue, dyspnoea, blurred vision, postural hypotension, asthenia, nasal congestion, miosis, chest pain, urinary frequency, weight gain, thrombocytopenia, decreased libido, back pain and pain in extremities.

SPECIAL PRECAUTIONS

- Prostatic cancer, kidney disease, liver disease, elderly, pregnancy, lactation, intraoperative floppy iris syndrome (IFIS), orthostatic hypotension, possibility of syncopal and orthostatic symptoms, especially at the initiation of therapy.
- Driving or hazardous tasks for 12 hrs after the first dose, after a dosage increase and after interruption of therapy when treatment is resumed.

TESTOSTERONE



Androgen

INDICATIONS

Replacement therapy in adult males for conditions associated with a deficiency or absence of endogenous testosterone:

- Primary hypogonadism (congenital or acquired): testicular failure due to conditions such as cryptorchidism, bilateral torsion, orchitis, vanishing testis syndrome, orchectomy, Klinefelter's syndrome, chemotherapy, or toxic damage from alcohol or heavy metals. These men usually have low serum testosterone concentrations and gonadotropins [follicle-stimulating hormone (FSH), luteinizing hormone (LH)] above the normal range.
- Hypogonadotropic hypogonadism (congenital or acquired): idiopathic gonadotropin or luteinizing hormone-releasing hormone (LHRH) deficiency or pituitary-hypothalamic injury from tumors, trauma, or radiation. These men have low testosterone serum concentrations, but have gonadotropins in the normal or low range.

MECHANISM OF ACTION

Endogenous androgen responsible for the normal

growth and development of male sex organs and secondary sexual characteristics.

DOSAGE

Adult: Hypogonadism (Slow intramuscular injection): initially 200 to 250 mg every 2 to 3 weeks; maintenance dose 200 to 250 mg every 3 to 6 weeks.

Topical testosterone products may have different doses, strengths, or application instructions that may result in different systemic exposure

CONTRAINDICATIONS

Breast cancer in men; prostate cancer; hypercalcaemia; pregnancy, lactation; nephrosis; history of primary liver tumours.

DRUG INTERACTIONS

- Oxyphenbutazone: elevated serum levels of oxyphenbutazone.
- Insulin: insulin requirement may decrease.
- Propranolol: increased clearance.
- Corticosteroids: enhanced edema.

ADVERSE EFFECTS

Prostate abnormalities and prostate cancer; headache, depression, gastrointestinal bleeding, nausea; polycythaemia; cholestatic

jaundice; changes in libido; gynaecomastia, anxiety, asthenia; generalized paraesthesia; electrolyte disturbances including sodium retention with oedema and hypercalcaemia; increased bone growth; androgenic effects such as hirsutism, male-pattern baldness, seborrhoea, acne, priapism, precocious sexual development and premature closure of epiphyses in prepubertal males, virilism in females, and suppression of spermatogenesis in men.

SPECIAL PRECAUTIONS

- Cardiac, renal or hepatic impairment; elderly; ischaemic heart disease; hypertension, epilepsy; migraine; diabetes mellitus; skeletal metastases (risk of hypercalcaemia); regular examination of prostate during treatment; prepubertal boys; breathing disturbance.
- Children should avoid contact with unwashed or unclothed application sites in men using testosterone gel.
- Healthcare providers should advise patients to strictly adhere to recommended instructions for use.

TOLTERODINE TARTRATE



Selective muscarinic receptor antagonist

INDICATIONS

Indicated for the treatment of over active bladder with symptoms of urinary frequency and urgency with or without urge incontinence.

MECHANISM OF ACTION

After oral administration, tolterodine is metabolized in the liver, resulting in the formation of the 5-hydroxymethyl derivative. Both tolterodine and metabolite have antimuscarinic activity. It ultimately relieves frequency, urgency and urge incontinence.

DOSAGE

The recommended dose is 2 mg bid. In hepatic or renal impairment and those receiving P450 3A4 inhibitors,

the recommended dose is 1 mg bid. In case of trouble some side effects, dose may be reduced from 2 mg to 1 mg bid.

CONTRAINDICATIONS

Hypersensitivity to the drug or its ingredients, urinary retention, gastric retention or uncontrolled narrow-angle glaucoma.

DRUG INTERACTIONS

- CYP 3A4 Inhibitors significantly increase plasma concentrations of tolterodine in poor metabolizers
- For patients receiving ketoconazole, itraconazole, miconazole, erythromycin, clarithromycin, cyclosporine or vinblastine, the recommended dose is 1 mg twice daily.

ADVERSE EFFECTS

Dry mouth, constipation, vertigo/dizziness, abdominal pain, abnormal vision, urinary retention, xerophthalmia.

SPECIAL PRECAUTIONS

- Use cautiously in patients with clinically significant bladder out flow obstruction, pyloric stenosis, narrow-angle glaucoma, in hepatic or renal impairment.
- Patients should be advised to exercise caution in decisions to engage in potentially dangerous activities until the drug's effects have been determined.

**INDICATIONS**

Overactive bladder with symptoms of urge urinary incontinence, urgency, and urinary frequency.

MECHANISM OF ACTION

Antagonizes the effect of acetylcholine on muscarinic receptors in cholinergically innervated organs, and reduces the tone of smooth muscle in the bladder.

DOSAGE

20 mg twice daily; should be dosed at least one hour before meals or given on an empty stomach. For patients with severe renal impairment ($\text{CL}_{\text{cr}} < 30 \text{ mL/min}$), the recommended dose is 20 mg once daily at bedtime. In geriatric patients ≥ 75 years of age, dose may be titrated down to 20 mg once daily based upon tolerability.

CONTRAINDICATIONS

Urinary retention, gastric retention, or uncontrolled narrow angle glaucoma and in patients who are at

risk for these conditions. Also contraindicated in hypersensitivity to the drug or its ingredients

DRUG INTERACTIONS

Concomitant use with other anticholinergic agents may increase the frequency and/or severity of anticholinergic effects. Drugs that are eliminated by active tubular secretion (e.g. procainamide, pancuronium, morphine, vancomycin, metformin and tenofovir) might increase the serum concentration of trospium chloride and/or the coadministered drug.

ADVERSE EFFECTS

Angioedema of the face, lips, tongue and/or larynx, dry mouth, vision blurred, abdominal distension, dysgeusia, dry throat, and dry skin.

SPECIAL PRECAUTIONS

- Angioedema: If involvement of the tongue, hypopharynx, or larynx occurs, trospium chloride should be promptly discontinued and appropriate

therapy and/or measures necessary to ensure a patent airway should be promptly provided.

- Controlled narrow-angle glaucoma: use only if the potential benefits outweigh the risks and in that circumstance only with careful monitoring.
- Clinically significant bladder outflow obstruction: risk of urinary retention.
- Decreased gastrointestinal motility: risk of gastric retention.
- Renal Insufficiency, $\text{CL}_{\text{cr}} < 30 \text{ mL/min}$: dose modification is recommended; 20 mg once a day at bedtime.
- Hepatic Impairment: to be used with caution.

**INDICATIONS**

Sterility, amenorrhoea, defective spermatogenesis, delayed puberty.

MECHANISM OF ACTION

It is an extract of the urine of post-menopausal women containing FSH.

DOSAGE

Adults: It varies from patient to patient and in the same patient at different times. This can be detected by carrying out hormonal assays.

- Schedule I: 3 equal doses given on alternate days.
- Schedule II: Give daily till response is achieved.

CONTRAINDICATIONS

Contraindicated in women who have:

- A high FSH level indicating primary ovarian failure.
- Uncontrolled thyroid and adrenal dysfunction.
- An organic intracranial lesion such as pituitary tumor.
- Presence of any cause of infertility other than anovulation.
- Abnormal bleeding of undetermined origin.
- Ovarian cyst or enlargement not due to polycystic ovary syndrome.
- Prior hypersensitivity.
- Pregnancy.

ADVERSE EFFECTS

Ovarian hyperstimulation, multiple pregnancy, local reactions.

SPECIAL PRECAUTIONS

- Ovarian cysts, adrenal or thyroid disorders, hyperprolactinoma or pituitary tumour.
- Should only be used by the physicians who are thoroughly familiar with infertility problems. Therapy requires time commitment by the physicians and supportive health professionals, and the availability of appropriate monitoring facilities.

In sexually active men with LUTS due to BPH



Alfuzosin HCl 10 mg + Dutasteride 0.5 mg Tablets

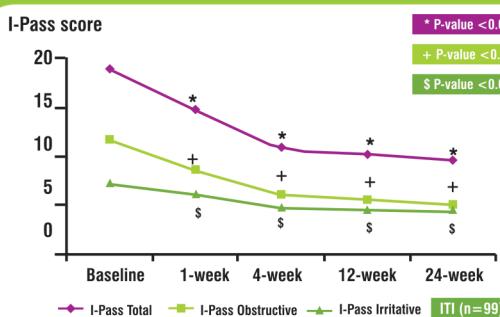
Accelerated Control. Enhanced Convenience.

Alfuzosin shows incredible first dose efficacy

First day First Dose of Alfuzosin shows¹

- Improved urodynamically measurable effect on BOO due to BPH
- Significant increase in Qmax as soon as 8 hrs after initial dose

Significant improvement in Total, Obstructive & Irritative IPSS²



Dutasteride in Afdura³

- Decreases risk of BPH progression
- Significantly lesser incidence of AUR or BPH-related surgery compared to placebo ($P<.001$)

In OAB



Extended Release Darifenacin 7.5mg/15mg Tablets

Compliance Delivered

- Patients on darifenacin experienced significant reduction in incontinence episodes as early as the 2nd week
- Darifenacin was not found to have any significant effects on CNS and cardiovascular system

Efficacy of darifenacin for reduction in urgency episodes*

	Darifenacin 7.5 mg QD (N=229)	Darifenacin 15 mg QD (N=115)	Placebo (N=164)
Median # of incontinence episodes per week:			
Baseline	16.3	17.0	16.6
Week 12 (95% CI)	5.0(3.7-6.0)	4.7(3.7-7.0)	8.0(4.8-10.0)
Median % change from baseline	-67.7	-72.8	-55.9
P value for treatment difference	.010	.017	-

"Harmony that bring back
the Bladder Symphony"

Ref.: Formulary. 2004;39:291299

