GP EDUCATION - OAB
KERANG

MISS JANELLE BRENNAN
22nd June 2017
Overactive Bladder (OAB)
Learning Objectives - OAB

- Understand how to make a diagnosis of Overactive Bladder (OAB) and understand findings that prompt a specialist referral
- Understand the differential diagnosis of OAB
- Understand how to apply 1st and 2nd line strategies of OAB management including the use of medical therapy
- Overview of 3rd line treatments for OAB
  - Learning objectives are based on combined USANZ/UGSA position statement 2015
OAB

- Urgency, with or without urgency urinary incontinence (UUI), that is often associated with frequency and nocturia

- Absence of pathological (e.g. UTI) or metabolic causes (e.g. uncontrolled DM)

- OAB suggests underlying detrusor overactivity (DO) on urodynamics, but may be caused by other voiding or lower urinary tract dysfunction

- Classification:
  - OAB – dry or OAB -wet
  - Neurogenic or Idiopathic
    - Neurogenic – suprasacral and suprapontine causes e.g. SCI, MS, spina bifida (CVAs, parkinson’s disease)
    - Idiopathic – no known cause (but is a/w dementia, etc)
OAB Epidemiology

- Up to 16% population (Europe and American cohort)
  - Increased incidence in Elderly
  - Elderly > 65 y.o. -> 30% OAB vs 16.5% of overall population

- Large impact on QoL

- 2010 Australia – total financial cost of UI excluding burden of disease was nearly 43 billion
Clinical Assessment in Primary Care

- Urgency with or without UUI must be present for the diagnosis of OAB

- History – rapidity of onset, duration and severity of symptoms
  - Pad usage inc weight, size, number and number of UI episodes a day
  - Bladder diary
    - Frequency with small capacity
    - Amount and type of fluids esp caffeine, artificial sweeteners, alcohol
    - Exclude polydypsia and nocturnal polyuria (>33% fluid output at night)
Other history clues

- **Stress Urinary Incontinence (SUI)**
  - Mixed incontinence – what is the most bothersome symptom but often need specialist opinion or pelvic floor physiotherapy referral

- **Outflow obstruction**
  - Hesitancy, intermittency, poor flow, feeling of incomplete emptying
  - Men - ?bladder outlet obstruction causing storage symptoms
  - Women – dyspareunia, altered bowel habit esp constipation
    - ?Pelvic floor dysfunction/hypertonic pelvic floor → physio opinion

- **Neurogenic e.g CVA, PD, MS, diabetes**
  - May be 1st presentation of neurological disease so look for neurological symptoms

- **OSA – nocturia though increased brain natriuretic peptide**
## Specialist referral

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Signs</th>
<th>Surgical history</th>
<th>Medical history</th>
</tr>
</thead>
<tbody>
<tr>
<td>Haematuria</td>
<td>Over-distended bladder</td>
<td>Past urological surgery</td>
<td>Pelvic radiation/pelvic malignancy</td>
</tr>
<tr>
<td>Recurrent UTI</td>
<td>Neurological deficits</td>
<td>Past incontinence surgery</td>
<td>Neurological disease</td>
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<tr>
<td>Sterile pyuria</td>
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<td>Nocturnal Incontinence</td>
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<tr>
<td>Life-long incontinence</td>
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<tr>
<td>Significant obstructive symptoms</td>
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<tr>
<td>Associated bowel symptoms/constipation</td>
<td></td>
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<tr>
<td>Neurological symptoms</td>
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</tbody>
</table>
Examination

- General – obesity, cognitive state, hand co-ordination, gait disturbance

- Abdo and pelvic
  - Over distended bladder, pelvic mass or pelvic tenderness
  - Male – urethral meatus, DRE
  - Neurological – focused S2-4 exam inc. sensation, anal tone and bulbocavernosus reflex
  - Female – atrophic vaginitis, stress leakage with cough and valsalva, pelvic organ prolapse (POP)

- Pelvic Organ Prolapse (POP)
  - Some pts with POP present with OAB symptoms but there is poor correlation between the two
  - There is some data to show that repair of POP may improve OAB symptoms in up to 80% of patients, but there is also the risk that a small but significant percentage of pts (<20%) develop de novo OAB after prolapse treatment
Investigation

- MSU to exclude infection, haematuria and sterile pyuria
- Post void residual (PVR) to exclude obstruction and incomplete emptying

- Bladder diary (referral to continence nurse)
  - Polydipsia
  - Nocturnal polyuria (NP)- nocturnal voided volume >33% of 24 hour urine volume
  - Compromised functional bladder capacity with voids < 250ml
Elderly

"Do you know what I fear most about old age?"

"No what?"

"Incontinence!"
Elderly and OAB

- OAB more common with ageing

- Lower physiological reserve to deal with adverse effects of treatment

- Identify patients at higher risk for anticholinergic side effects – cognitive dysfunction, weakness, reduced mobility, constipation and glaucoma, polypharmacy, especially drugs with anticholinergic effects

- Review medication list e.g. diuretics – increase urinary frequency
Anticholinergics and Dementia – JAMA 2015

Cumulative Use of Strong Anticholinergics and Incident Dementia
A Prospective Cohort Study

Shelly L. Gray, PharmD, MS; Melissa L. Anderson, MS; Sascha Dublin, MD, PhD; Joseph T. Hanlon, PharmD, MS; Rebecca Hubbard, PhD; Rod Walker, MS; Onchee Yu, MS; Paul K. Crane, MD, MPH; Eric B. Larson, MD, MPH

- Higher cumulative anticholinergic use is associated with an increased risk for dementia
- Most common anticholinergic classes were tricyclic antidepressants, first-generation antihistamines and bladder antimuscarinics
- Mean follow up of 7.3 years, 797 participants → 23.3% developed dementia (79.9% of these Alzheimer’s)
Overview

- 3 essential elements before embarking on management pathway of uncomplicated OAB
  - Negative MSU
  - Minimal PVR
  - Bladder diary c/w OAB

- Complicated cases – refer to specialist
Complicated OAB

- Neurological disease
- Microscopic haematuria
- Failed conservative Rx

Specialist management
- Renal US to exclude upper tract damage with neurogenic detrusor overactivity (NDO) and high pressures
- Cystoscopy if recurrent UTI, haematuria, persistent pyuria, refractory to medical therapy – exclude bladder tumours
- Urodynamics – refractory to conservative Rx and/or underlying neurological disease
Management

1\textsuperscript{st} line therapy – behavioural, lifestyle, physiotherapy
2\textsuperscript{nd} line therapy – antimuscarinics, topical ovestin, mirabegron
3\textsuperscript{rd} line therapy – botulinum toxin, sacral neuromodulation and peripheral tibial nerve stimulation
Conservative Mx – 1st line

- **Lifestyle** – diet, fluid intake, weight loss
- **Reduce caffeine**
  - caffeine results in CNS stimulation and smooth muscle relaxation
- **Higher fluid intake may result in increased urinary frequency**
- **LOW**
  - Weight loss of 8% over 6/12 reduced UUI by 42% compared to 26% in controls
- **Behavioural therapy** – bladder training and pelvic floor physiotherapy (PFMT)
  - Behavioural therapies may improve UI episodes by 50-80% in both men and women
Behavioural therapies (BT)

- Scheduled voiding – carers initiate voiding
- Fixed voiding schedule or defer voiding until urgency sensation settles
- BT alone is as effective as oxybutynin (*Ditropan*) and Solifenacin (*Vesicare*) in controlling UUI and nocturnal UI
- PFMT is usually used in conduction with urge suppression techniques
- Effectives of BT diminishes after the treatment has ceased
MEDICATIONS – 2ND LINE MANAGEMENT

- **ANTICHOLINERGICS**
  - Non selective and selective

- **B3 AGONISTS**
  - Mirabegron (Betmiga)

- **TOPICAL OESTROGEN**
  - NOT HRT
Medical therapy – 2\textsuperscript{nd} line MX

- **POTENTIAL CONTRAINDICATIONS:**
  - **ANTICHOLINERGICS**
    - Narrow angle glaucoma - untreated
    - Functional gastrointestinal pathology
    - Myasthenia gravis
  
  - **BETA 3 AGONISTS e.g. MIRABEGRON**
    - Cardiac history esp prolonged QT interval
    - Uncontrolled HT
    - Renal and liver impairment
Medical therapy - antimuscarinics

- Work synergistically with lifestyle changes and BT
- Rates of improvement or cure of UUI based on treatment of up to 3 months
- Patients with more bothersome symptoms are more likely to experience symptom improvement

Australian formulary:
- Non selective – Oxybutynin IR (Ditropan)
  - 2.5-5mg bd to qid (can also use prn)
  - Transdermal (avoid 1st pass metabolism)- Oxytrol patch
- M3 selective blockers (non PBS listed, but on RPBS)
  - Fewer antimuscarinic side effects
  - Solifenacin (Vesicare) – 5mg and 10mg daily (~$46 and $70)
  - Darifenacin (Enablex) – 7.5mg and 15mg (~$46)
Anticholinergic Side Effects

- Dry mouth most prevalent – ditropan (oxybutinin IR) > Darifenacin 15mg

- Transdermal (TD) oxybutinin dry mouth 9.6% v 68% oxybutinin IR (9x difference) but overall higher rate of withdrawal due to allergic skin reaction

- In general discontinuation rates were similar for treatment arms irrespective of differences in the occurrence of dry mouth

- Other side effects – constipation, cognitive decline/memory impairment, blurred vision, C/I in uncontrolled narrow angle glaucoma

- >50% pts with discontinue antimuscarinic agents within the 1st 3 months because of failure in efficacy, bothersome side effects and the financial burden

- Can use oral moisturisers for dry mouth and treat constipation with laxatives, fibre and regular physical activity for constipation
Other considerations in drug prescribing

- **Cognitive Impairment**
  - Oxybutyin IR may worsen cognitive function with ER formulation safer as it does not cause delirium in the short term
  - Solifenacin, tolterodine and darifenacin have not been demonstrated to impair cognitive function in the *healthy elderly*

- **Other medications:**
  - Drugs used to control PD, myasthenia, dementia and Alzheimers may reduce the effects of anticholinergics
  - E.g. Alzheimers meds may cause symptoms of OAB - procholinergic
Recommendations - Antimuscarinics

- Offer behavioural Rx as well as antimuscarinic drugs for adults with UUI
  - Concomitant behavioural modulation (BT, PFMT) and antimuscarinic therapy has been shown to improve outcome parameters such as frequency, voided volume, UI and symptom inconvenience

- Offer and encourage early review of efficacy and side effects of pts on antimuscarinics for UUI < 30 days
  - No role for anticholinergic cycling with > 2 diff drugs

- Exercise caution when prescribing antimuscarinics in elderly esp if background dementia, Alzheimers and other neurological conditions
Mirabegron

- Novel B3 agonist which produces relaxation of bladder smooth muscles → increased urine storage function
  - Became available in Australia in April 2014

- Dry rate 45-50% vs placebo 35-40%

- In men with LUTS and BOO, mirabegron did not adversely effect voiding urodynamic parameters

- Well tolerated in elderly but increased risk of HT

- Long term side effects are uncertain
Mirabegron – practical prescribing

- 25mg and 50mg doses (not on PBS, but on RPBS if failed antimuscarinic)
  - ~$54

- Drug Interactions/Contraindications
  - Mild prolongation of QT interval – care with sotalol, amiodarone, haloperidol, erythromycin, clarithromycin
  - CYP2D6 inhibitors e.g. flecanide, metoprolol
  - Digoxin
  - Pregnancy/breast feeding/paediatrics
  - Uncontrolled hypertension
    - Average rise in pulse rate of 2 bpm and 4% participants withdrew from RCT due to adrenergic side effects

- Need to check BP post treatment and avoid if uncontrolled hypertension

- 25mg dose only if renal or hepatic impairment or risk of drug interaction
Combination therapy

- Antimuscarinics and mirabegron
- Safe but not very cost effective
- Is more efficacious
Topical oestrogens

- Reduces UI, frequency and urgency in OAB
- Should be offered to postmenopausal women with UI and vaginal atrophy
- 3 month course

Topical ovestin (my preference) vs vagifem low
3rd line therapy

- Failure of, or intolerance to, two or more pharmacological therapies
  - Botulinum Toxin A (Botox)
  - Sacral neuromodulation (SNM)
  - Percutaneous tibial nerve stimulation (PTNS)

- If these fail – augmentation, urinary diversion or permanent catheterisation
Botulinum toxin A

- Dampens down the urges and bladder contractions by blocking neuromuscular transmission

- Binds to sites on motor or sympathetic nerve terminals and blocks ACH release from the synaptic vesicles
  - Neurotoxin cleaves protein SNAP-25 which is responsible for docking and release of acetylcholine from presynaptic vesicles located within the nerve endings

- When injected into the muscle at therapeutic doses, botox produces a partial chemical denervation of the muscle resulting in a localized reduction in muscle activity
  - Causes axonal sprouting so reinnervation occurs thus reversing muscle denervation
Mechanism of Action

[Diagram showing the mechanism of action with presynaptic nerve terminal, ACh vesicles, BT, SNAP-25, ACh fusion & release, and BT blocking ACh release to muscle.]
# Botulinum Toxin A Formulations

<table>
<thead>
<tr>
<th>Generic Name</th>
<th>OnabotulinumtoxinA</th>
<th>AbobotulinumtoxinA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brand name</td>
<td>Botox</td>
<td>Dysport</td>
</tr>
<tr>
<td>Manufacturer</td>
<td>Allergan Inc (United States)</td>
<td>Ipsen (France)</td>
</tr>
<tr>
<td>Packaging, U/vial</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Storage of packaged product</td>
<td>-5 °C or 2-8 °C</td>
<td>Room temperature</td>
</tr>
<tr>
<td>Storage after reconstitution</td>
<td>2-8 °C for 24 h</td>
<td>2-8 °C for several hours</td>
</tr>
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</table>
HISTORY OF BOTOX

2000

Schurch NDO
RCT-placebo/200/30
J Urol 2005

2007

Karsenty
Eur Urol
Systematic Review NDO

2010

Phase 2
Doses for OAB
Dmochowski
J Urol 2010

Phase 3 RCT in NDO
SCI (T1 & below), MS

Cruz
Eur Urol
Ginsberg
J Urol

2011 2012

PBS approval
November

2013

Phase 3 RCT OAB
Nitti J Urol 2013
Chapple Eur Urol 2013

2015
INDICATIONS

- **URINARY INCONTINENCE WITH INADEQUATE RESPONSE TO/INTOLERANT TO ANTICHOLINERGIC MEDICATIONS**

- **NEUROGENIC DETRUSOR OVERACTIVITY** e.g. MS, SCI, cerebral palsy
  - Usual dose is 200U

- **IDIOPATHIC OVERACTIVE BLADDER (OAB-WET)**
  - Usual dose is 100U

- *PBS restrictions*
  - Urologist or uro-gynaecologist
  - > 8 incontinence episodes/week
  - Failure to respond to >2 anticholinergic drugs
  - Willing and able to perform CISC
  - Urodynamics if NDO

- Off label use
  - Setting of suprapubic catheterisation (prevents bypassing, UTIs)
  - Pelvic floor injections
PRECAUTIONS

- Contraindication – Acute UTI

- Warnings
  - Potency units are not interchangeable
  - Rare risk spread of injection c/w botox side effects e.g. muscle weakness
  - Potential drug interaction with other agents that interfere with neuromuscular transmission e.g. Aminoglycosides (gentamicin)
  - Max 360U in 3 months period

- Basically – extremely safe! (although 4kg in the water supply would be enough to kill the entire human population)
Preop counselling

- Botox treatments rather than injections

- Side effects are uncommon, usually mild and self-limiting

- Risks
  - Temporary need for intermittent self catheterisation due to incomplete emptying of bladder
    - Patients must be thoroughly counselled about the risk of temporary urinary retention (~6%) and must be willing and able to perform clean intermittent catheterisation (CIC) if necessary
  - Urinary tract infection
  - Minor haematuria
  - Failure
  - Need for repeat injection
    - Median duration effect 7.2 months
Given under local anaesthetic (intravesical instillation)
Intravesical Botox
Post op

- Discharge home once voided
  - Ideal to check PVR

- Usually starts to take effect between 3-7 days

- Review ~ 2 weeks for post void residual check

- May be discharged with oral antibiotics

- Booked in for next injection if repeat offender, otherwise review at 6-8 weeks to assess response
Neurogenic Detrusor Overactivity (NDO)
Neurogenic DO

- **DIGNITY clinical research program**
  - 2 large regulatory phase III trials (funded by Allergan)
  - Efficacy & safety in pts with NDO due to SCI (T1 or below) or MS
  - 691 patients with >14 UI episodes/week
  - Placebo vs 200U vs 300U

- **Patient Group**
  - Young – mean age 45.9 years
  - Severe UI – mean 32 episodes of UI/week
  - ~ 55% were using CIC at baseline
  - ~ 55% had MS vs SCI
  - ~ 45% male
Pooled Data – Efficacy @ Week 6

<table>
<thead>
<tr>
<th></th>
<th>Placebo, n=241</th>
<th>Botox 200U, n=227</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change baseline UI episodes</td>
<td>-10.5</td>
<td>-21.3</td>
</tr>
<tr>
<td>100% reduction in UI episodes</td>
<td>9.1%</td>
<td>37.0%</td>
</tr>
<tr>
<td>&gt;50% reduction in UI episodes</td>
<td>39%</td>
<td>76%</td>
</tr>
<tr>
<td>Satisfied with treatment</td>
<td>44.2%</td>
<td>78.5%</td>
</tr>
</tbody>
</table>
### Pooled Data – Adverse Events

<table>
<thead>
<tr>
<th>Condition</th>
<th>Placebo, n=235</th>
<th>Botox 200U, n=226</th>
</tr>
</thead>
<tbody>
<tr>
<td>UTI</td>
<td>36.2%</td>
<td>51.8%</td>
</tr>
<tr>
<td>Urinary retention</td>
<td>3.4%</td>
<td>19.9%</td>
</tr>
<tr>
<td>Fever</td>
<td>3.4%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Haematuria</td>
<td>3.4%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Fatigue</td>
<td>3.0%</td>
<td>7.1%</td>
</tr>
<tr>
<td>Vulvovaginal candidiasis</td>
<td>2.5%</td>
<td>5.3%</td>
</tr>
<tr>
<td>Muscular weakness</td>
<td>2.1%</td>
<td>4.4%</td>
</tr>
</tbody>
</table>
DIGNITY trials - Satisfaction

(a) Initiated CIC
- Placebo
- OnabotA 200U
- OnabotA 300U

(b) No CIC
- Placebo
- OnabotA 200U
- OnabotA 300U
NDO Summary

- 200U was the preferred dose
- Effect is usually seen at 2 weeks
- Median duration of response is ~ 9 months
- Patient will have ~ 10 less episodes of UI/week, ~ 37% will be dry, ~ 75% will have a 50% improvement
- 4 in every 5 patients will be satisfied with their Botox treatment
- CIC/UTI rates depend on underlying neurological disorder
  - 70% patients do not require CIC
  - De novo CIC higher in MS pts, but most SCI pts already performing CIC
OAB - wet
Phase 2 Dose Ranging Trial

- 50-300U botox in patients with OAB
- 313 patients (288 female, 92%)
- Doses > 150U contributed minimal additional improvement in symptoms
- Elevated PVRs (>200mls)/CIC use is dose dependent
  - Denovo CIC was started in 21% patients who received the 200U dose

- Dose with optimal risk-benefit profile was 100U
OAB Study Population

- 1105 patients
- 100U vs placebo

**Inclusion criteria**
- >3 UUI episodes over 3 days
- > 8 voids/day
- PVR <100ml
- symptoms are not managed adequately with anticholinergics

**Enrolled patients**
- Average duration OAB 5.5-6.7 years
- Used ~ 2.5 anticholinergics for a mean of 2.4 years
- **Average 5.3 to 5.6 UI episodes per day at baseline**
# Outcomes & Adverse Events

<table>
<thead>
<tr>
<th></th>
<th>Placebo, n=277</th>
<th>Botox 100, n=280</th>
<th>Placebo, n=271</th>
<th>Botox 100, n=277</th>
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</thead>
<tbody>
<tr>
<td>Av. Change of UI episodes/day</td>
<td>-0.87</td>
<td>-2.65</td>
<td>-1.03</td>
<td>-2.95</td>
</tr>
<tr>
<td>+ve response TBS</td>
<td>29.2%</td>
<td>60.8%</td>
<td>26.8%</td>
<td>62.8%</td>
</tr>
<tr>
<td>Av % change of UI episodes/day</td>
<td>-12.5</td>
<td>-47.9</td>
<td>-16.8</td>
<td>-53.1</td>
</tr>
<tr>
<td>Av % change micturition/day</td>
<td>4.1</td>
<td>-16.9</td>
<td>-6.0</td>
<td>-19.7</td>
</tr>
<tr>
<td>Av % change nocturia/day</td>
<td>+0.2</td>
<td>-20.2</td>
<td>-8.8</td>
<td>-25.1</td>
</tr>
<tr>
<td>UTI</td>
<td>5.9%</td>
<td>15.5%</td>
<td>9.6%</td>
<td>24.1%</td>
</tr>
<tr>
<td>CIC rates</td>
<td>0%</td>
<td>6.1%</td>
<td>0.7%</td>
<td>6.9%</td>
</tr>
</tbody>
</table>

Complete continence 22.9% treated pts vs 6.5% placebo
CIC rates/duration in Botox for OAB wet

Nitti et al, J Urol 2013

Purple = no CIC
Blue = CIC <= 6 weeks
Yellow = CIC >6w and < 12w
Green = CIC >12w

93.9%
Sacral NeuroModulation (SNM)

- Most long term safety and efficacy data

- Addresses an imbalance of facilitatory and excitatory control systems by direct or indirect action on afferent nerves, predominantly the S3 nerve root, or pudendal or tibial nerve

- Electrical stimulation inhibits bladder activity by stimulating large diameter somatic afferent fibres within in turn evoke central inhibition of the micturition reflex in the spinal cord and brain

- Over 100,000 implants have been placed worldwide (for both urinary and faecal incontinence)

- Therapeutic success is defined as a >50% improvement in symptoms such as leakage or frequency episodes
SNM – patient selection

- Willingness to modify the programming, ongoing cognitive capability to do so and the possibility of undertaking repeat procedures in up to 30%

- MRI (except of brain) is contraindicated after implantation and is recommend to turn off in event of pregnancy

- Safe in presence of PPM

- Fully reversible Rx – no elevated PVR and faecal incontinence may improve with this single treatment
Sacral nerve stimulation
Sacral Nerve Stimulation

- Medtronic

- Electrode in S3 nerve root
  - Urinary frequency/urgency/incontinence
  - Urinary retention
  - Faecal urgency/incontinence

- 2 stages – lead then implantable generator

- Unable to have spinal MRI

- 70% chance of 50% improvement for OAB and 50% chance of 50% improvement for urinary retention (Even better success with faecal incontinence)

- Unable to have MRI spine (although can have MRI head, 1.5T magnet)

- Follow up clinic available in Bendigo (need GP referral)
Posterior Tibial Nerve Stimulation (PTNS)

- Tibial nerve – mixed sensory and motor nerve
- Outpatient setting (Acupuncture needle)- weekly 30 min visits for 12 weeks followed by monthly visit for 12 months
- Labour intensive for physician and patient and results do not continue once the treatment is ceased
- Cost ~ $1000
New developments
Urolift
Can be day case (even under LA)
No significant median lobe
Can have TURP if unsuccessful
No sexual side effects
Funded in private
Nocturnal polyuria

- Nocdurna
  - Low dose desmopressin formulation
  - 25mcg women, 50mcg men
  - Private script – released April 2017
  - Main risk is hyponatremia – need close monitoring of Na
Post prostatectomy incontinence

Male slings
  Advance
  ATOMS

Urinary sphincter (Gold standard)
AdVance Male Sling

- Restores urethra to its proper anatomical position for sphincter function
- Spinal or GA
- 3 small incisions
- Transobturator approach
- IDC overnight
- ~85-90% success rate
- $5000 for sling
LHRH ANTAGONIST: DEGARELIX (FIRMAGON)

- 240mg loading dose (subcut)
- 80mg monthly injections subcut
- Slow injection over 60 seconds
- Doesn’t require flare cover (i.e. do not need cosudex as in LHRH agonist)
- More cardio-protective compared to standard LHRH agonists e.g. lucrin (6/12), eligard (6/12), zoladex (3/12)
Updates in Urology - Bendigo

- Mr David Heath
  - Urology Nurse Practitioner
  - Special interest in Prostate cancer and ED
  - Seeing ED referrals in rooms and visiting Swan Hill monthly

- Bendigo Health
  - Michael McClatchey, Janelle Brennan, Rohan Hall
  - Tony Makris (Fellow – recently obtained his FRACS (Urol))

- Dr. Sasmita Mohapatra
  - Continence GP (in training)

- Ms Jana Middlemis
  - Nurse Practitioner Candidate in Functional Urology
  - Bendigo Health – 54547632
Questions?