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Pharmacology Updates in Pediatric Endocrinology

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Hypothyroidism Treatments

- Synthroid / Levoxyll
 - Generic variability
 - May contain lactose, gluten or food dyes
 - GI conditions that affect absorption
 - Celiac disease
 - IBS
 - Prior gastric bypass
 - Lactose intolerance
- Tirosint gel caps
 - No generic
 - Made of gelatin, LT4, glycerin, and water
 - No dyes or allergens
 - Produced in dedicated facility
 - No cross contamination

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Hypothyroidism Treatments

- Synthroid / Levoxyll
 - Impact of gastric pH
 - May require 37% INCREASE in LT4 dose when given in presence of acid reducers
- Tirosint gel capsules
 - Tirosint least impacted by gastric acidity
 - Doses 13mcg thru 150mcg
 - Cannot split or crush
 - Packaged in color-coded blister pack to protect from moisture & light



Jenna, Dad, Amanda, & Mom
Spring Break fun

So many insulins.....
U-100, U-200, U-300, U-500
2, 3, 5 pens per pack
Expires in 28days, 42 days, 56 days

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Concentrated Insulins

- Humalog U-100 (300u/pen)
 - Approved for insulin pump
 - 5 pens per box
 - Avg < 45units/day
- Humalog U-200 (600u/pen)
 - Not for insulin pump
 - 2 pens per box
 - Avg > 45units/day

About every 7 days

Humalog U-100 KwikPen

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

About every 14 days

Humalog U-200 KwikPen

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					


Store in use at Room Temp < 86°F

- Away from heat/light
- Discard after 28 days

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Concentrated Insulins


- Toujeo (glargine 300u/ml)
 - 1:1 conversion from once daily basal
 - expect higher dose than Lantus
 - Administer at any time of day (same time daily)
 - 450units/pen (Packages of 3 or 5)
 - pH of 4 (same as Lantus)
- Steady state 5-8 days
- First dose of Toujeo may be inadequate for glycemic needs
- Onset of action 6 hours *
- Store in use at Room Temp < 86°F
 - Away from heat/light
 - Discard after 28 days



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Concentrated Insulins


- Tresiba insulin degludec
 - Onset 1 hour -- Duration up to 42 hours
 - Allow minimum of 8 hours between doses
 - Basal insulin with no true peak
 - Steady state 3-4 days
 - Store in use at Room Temp < 86°F
 - Away from heat/light
 - Discard after 56 days
 - Specifies not to refrigerate a pen in use



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Concentrated Insulins

<ul style="list-style-type: none"> • Tresiba U-100 <ul style="list-style-type: none"> • Holds 300units • 5 pens per box • 1 unit increments • 1 – 80 units • Blue & yellow 	<ul style="list-style-type: none"> • Tresiba U-200 <ul style="list-style-type: none"> • Holds 600units • 3 pens per box • 2 unit increments • 2 – 160units per dose • Blue & olive green 200
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Options for Testosterone Replacement

- Injections
 - Testosterone cypionate
 - IM injection q 2-4 weeks
 - Cottonseed oil
 - Testosterone enanthate
 - IM injection q 2-4 weeks
 - Sesame oil
 - Avedo ® /Testosterone undecanoate
 - Restricted availability
 - Risk for pulmonary oil microembolism & anaphylaxis
 - IM q 10 weeks
- Androderm ® patch
 - 2mg/24h and 4mg/24h
 - Apply daily at hs
 - Back, abd, thigh, arm
 - Allow 7d before reuse site
 - If site falls off before noon, place new patch and change that night
 - Keep dry for 3 hrs post
 - Skin reaction common
 - Burn like blisters (bony prominences)

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Gels for Testosterone Replacement

- Pros
 - Not a shot
 - Administered at home
 - More consistent dosing
 - Reviews indicate wide variance between different gels in absorption
- Cons
 - Time to dry
 - Transfers Testosterone
 - Odor
 - Feels sticky / tacky
 - Some prefer the 'boost' they feel post injection
 - Cost

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Gels for Testosterone Replacement

- Fortesta® 2%
 - Dries fast (less than 2.5min)
 - No odor, colorless
 - Volume less than a quarter
 - Concentrated apply with one finger to thigh/inner thigh
 - Not arm or shoulder
 - Keep area dry for 2hrs
- Testim ®
 - Reviews c/o long time to dry
 - Odor - questions about their cologne
- Androgel ® 1% and 1.62%
 - c/o cost 2 bottles of 1.62% were \$985
 - Dries quickly, No odor
- Vogelxo ® -- c/o feels tacky

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Testosterone Replacements

- Axiron® – topical solution
 - Applied underarm 1-2x/day
 - No odor
 - Low risk of transference
 - Mixed reviews
- Striant® (buccal tablet)
 - Apply to gum BID
 - Gum irritation 1st week
 - Trough am labs
 - Reapply if falls off within 8hrs
 - Replace every 12 hrs
- Testopel® pellet
 - 17a alkyl androgens
 - In office sterile procedure
 - SQ into abdominal tissue
 - Cellulitis ↑ in thin pts
 - Implant every 3-6 months
 - 6-12 pellets implanted
 - Rare for those on pellets to go back to injections
 - Study followed 973 implants over 13 years

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Testosterone – not all the same

- Bypass the Liver
 - Gels
 - Pumps
 - Patches
 - Topical solution
 - Short acting injections
 - Testosterone enanthate
 - Testosterone cypionate

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Testosterone...convenience carries risks

- 17a alkylandrogens (oral, depot injection, implants)
 - Metabolized in liver
 - Rare liver cancer
 - Monitor LFTs
 - Cholestatic hepatitis & jaundice occur at low doses
 - Liver tumors
 - Peliosis hepatitis – multiple blood-filled cavities in liver
 - Risk fatal hemorrhage
- Testopel® Pellets
- Aveed® 10 week injection
 - Risk of pulmonary oil microembolism
- Striant® buccal tablets
- Pills: Androxy®, Methitest®, Android® or Testred®

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Resources

- Package inserts
- WebMD reviews
