

Date: April 7, 2016
To: North, Edmonton, Central and South Zones, Physicians, Nurses and Laboratories
From: AHS Laboratory Services and *DynaLIFE_{Dx}*
Re: Thyroid Hormone Testing Changes

PLEASE POST OR DISTRIBUTE AS WIDELY AS APPROPRIATE

Key Messages:

- Effective April 12, 2016 reference intervals for thyroid stimulating hormone (TSH), free triiodothyronine (FT3) and free thyroxine (FT4) will be aligned across the province. The reference intervals will be aligned according to performing methodology.
 - Laboratories impacted: Bonnyville Healthcare Centre (BHC), Chinook Regional Hospital (CRH), Medicine Hat Regional Hospital (MHRH), Medicine Hat Diagnostic Laboratory (MHDL), Red Deer Regional Hospital Centre (RDRHC), St. Mary's Hospital (SMH), Queen Elizabeth II Hospital (QEIIH)
- All laboratories below will provide TSH Progressive (reflex) testing according to the recommended Alberta algorithm. This was previously offered in varying capacities in a few sites around the province.
 - TSH progressive testing is very valuable in suspected primary thyroid disease. Once therapy has been initiated, monitoring TSH alone is often most appropriate.
 - Laboratories impacted: BHC, CRH, *DynaLIFE_{Dx}* (DL), MHRH, MHDL, RDRHC, SMH, University of Alberta Hospital (UAH), and QEIIH.
- FT4 and/or FT3 can be ordered directly if required by listing in the appropriate space on the requisition.
- The new reference intervals are as follows:

| Analyte (measuring unit) | Testing Site | Age Range | Reference Interval |
|--------------------------|-----------------------------|------------------|--------------------|
| TSH (mIU/L or mU/L) | BHC, CRH, RDRHC, SMH, QEIIH | 0 d -13 d | 1.00 - 25.00 |
| | | 14 d - 76 d | 1.00 - 10.00 |
| | | 77 days - <1 yr | 0.40 - 7.00 |
| | | 1 yr - <5 yrs | 0.40 - 6.00 |
| | | 5 yrs - <14 yrs | 0.30 - 5.00 |
| | | 14 yrs - adult | 0.20 - 4.00 |
| | MHRH, MHDL | 1 d | 11.00 - 36.00 |
| | | 2 d | 8.00 - 20.00 |
| | | 3 d | 1.00 - 11.00 |
| | | 4 d - adult | 0.20 - 4.00 |
| FT4 (pmol/L) | BHC | 0 d - 13 d | 10.0 - 54.0 |
| | | 14 d - 76 d | 9.0 - 21.0 |
| | | 77 d - 13 yrs | 8.0 - 20.0 |
| | | 14 yrs -adult | 9.0 - 23.0 |
| | CHR, RDRHC, QEIIH | 0 d - 13 d | 10.0 - 54.0 |
| | | 14 d - adult | 9.0 - 23.0 |
| | MHRH, MHDL | 0 d - adult | 10.0 - 25.0 |
| | SMH | 0 d - 13 d | 11.0 - 65.0 |
| 14 d - adult | | 10.0 - 28.0 | |
| FT3 (pmol/L) | CRH, RDRH, MHRH, MHDL | 4 d - 30 d | 3.0 - 8.1 |
| | | 31 d - 1 yr | 2.4 - 9.8 |
| | | 2 yrs -6 yrs | 3.0 - 9.1 |
| | | 7 yrs - 11 yrs | 4.1 - 7.9 |
| | | 12 yrs - 17 yrs | 3.5 - 7.7 |
| | | 18 yrs – 150 yrs | 3.5 - 6.5 |

Provincial Progressive TSH Algorithm:

- If TSH is <0.20 mIU/L, then fT4 is automatically ordered. If this fT4 is low or in normal reference interval, then fT3 is automatically ordered.
- If TSH is from 0.20 to 6.10 mIU/L or it is significantly increased (> 10.00 mIU/L), than no further testing.
- If TSH is from 6.11 to 10.00 mIU/L, then fT4 is automatically ordered.

Why this is important:

- Reference intervals for TSH, FT4, and FT3 will now be aligned across the province; all laboratories performing thyroid hormone testing will report results that are more easily interpretable across sites.
- Progressive testing can improve patient care when primary thyroid disease is suspected. The recommended algorithm is derived from the AMA Toward Optimized Practice Thyroid Dysfunction Guideline.

Action Required:

- When ordering TSH, indicate the appropriate testing required:

| Test | Sites | Test Code | Additional Information |
|-----------------|-----------------------------|-----------|---|
| TSH Progressive | North, Central, South Zones | TSHP | TSH always reported. fT4 and fT3 reflexed only if indicated by algorithm. |
| | Edmonton Zone | TSHB | |
| TSH Alone | North, Central, South Zones | TSH | Only TSH measured/reported. Order for thyroxine therapy. |
| | Edmonton Zone | TSHBO | |

- North, Central and South Zone performing sites:
 - Review new reference intervals for your site.
 - Orders stating “TSH” will only have a TSH measured. Orders stating “TSH Progressive” plus fT4 and/or fT3 will only be completed according to the progressive testing rules.

Inquiries and feedback may be directed to:

Dr. Allison Venner, Clinical Biochemist, Central Zone at 587-876-4536 or allison.venner@ahs.ca

Mr. Trefor Higgins, Director of Clinical Biochemistry, *DynaLIFEDx*, at 780-451-3702 or trefor.higgins@dynalifedx.com

This bulletin has been reviewed and approved by:

Dr. James Wesenberg, AHS Provincial Medical/Scientific Director, Laboratory Services

Dr. Raymond Lai, Medical Director, *DynaLIFEDx*