

THYROID LAB ASSAYS

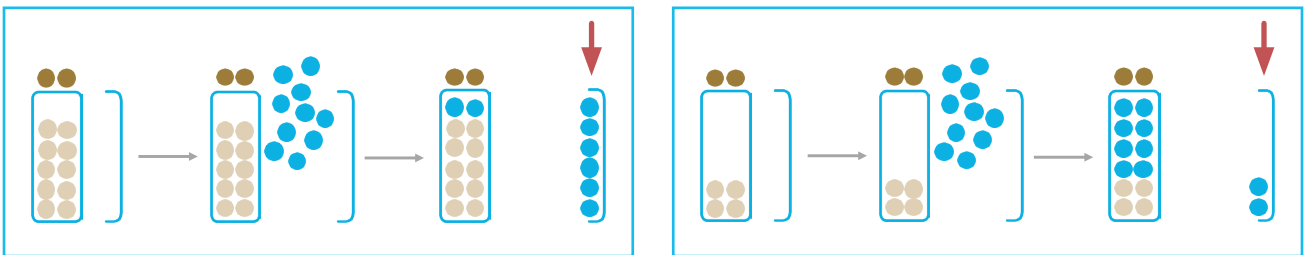
Assessing free hormone levels

Since total thyroid hormone levels can be affected by thyroid hormone binding protein levels, even in the setting of normal thyroid function, it is useful to have a method for measuring free thyroid hormone levels.

There are several methods for measuring free thyroid hormone:

1. Free hormone index:

- Combines total hormone levels and T3 resin uptake
- Increased production of thyroid hormone without changes in binding protein leads to greater percentage of binding sites being occupied = high T3 resin uptake
- Low thyroid hormone production without changes in binding protein results in more available binding sites = low T3 resin uptake



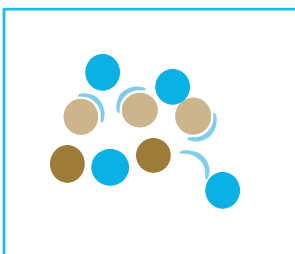
Total thyroid hormone x T3 resin uptake = free hormone index

High free hormone index = high free thyroid hormone levels

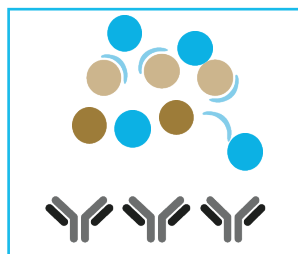
Normal free hormone index = increase in binding proteins

Low free hormone index = low free thyroid hormone levels

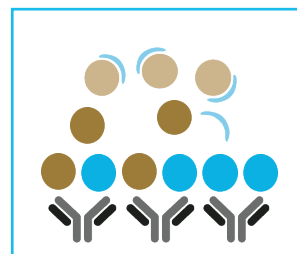
2. Immunoassay:



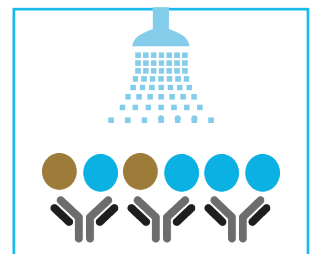
Patient's serum is mixed with a labeled thyroid hormone analog.



Antibody specific for free thyroid hormone is bound to solid state.



Free thyroid hormone and labeled analog compete for binding to antibody.



Sample is rinsed, and amount of bound labeled analog is measured.

- **High** free thyroid hormone levels > less bound labeled analog

- **Low** free thyroid hormone levels > more bound labeled analog

3. Equilibrium dialysis:

Most accurate method for measuring free thyroid hormone.

- Patient's serum placed on one side of a semipermeable membrane.
- Free thyroid hormone will diffuse across the membrane and can be measured.

