

LabVis: Simple and Intuitive Visualization of Medical Laboratory Results

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CPSC 533 Final Project Presentation
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Current Method

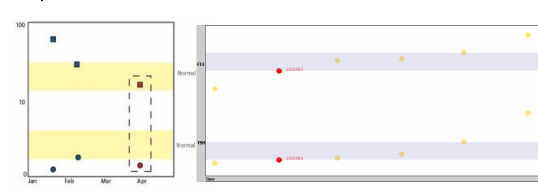
Patient: 17950 DUCK RONALD Clinical Software Solutions
 DOB: 07/10/48 Age: 51 Sex: M 219 South Fir Street
 Category: Facility: Room: Chandler, AZ 85226
 Physician: E. L. ETRIND, M.D. Phone: (602)970-5000 ext. 4070/946.1011x

Test	Range	Units	Result	Result	Result	Result	Result	Result	Result	Result
Cumulative			01/13/00	01/19/00	01/19/00	01/19/00	01/19/00	01/19/00	01/19/00	01/19/00
CA	8.5-10.4	ng/dl					10.5	0.0		
PHOS	2.4-4.2	mg/dl								
OLUC	64-112	mg/dl					111	0		
BUN	7-19	mg/dl					18	0		
CREA	0.7-1.4	mg/dl					1.3	1-1		
URIC	2.2-8.4	mg/dl								
TP	6.0-8.2	g/dl					6.0	0.0		
ALB	3.7-5.2	g/dl					5.0	0.0		
TBL	0.1-1.2	mg/dl					1.1	0.0		
ALP	53-128	U/L					120	0		
LDH	100-220	U/L								
AST	9-34	U/L					33	0		
ALT	5-37	U/L								
TSH	0.3-4	U/L					0.13	0.15		
FT4	12-21	U/L					23	23		

Project Goals

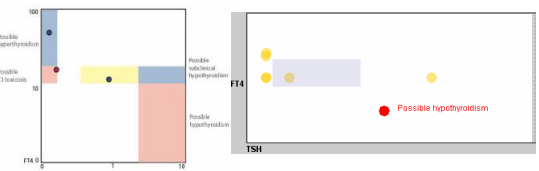
- To develop an effective visualization for displaying and interacting with medical laboratory results
- Must support diagnosis, monitoring of treatment, and education of medical students
- Evaluate using real scenarios

Vis 1 - Time-Series Overview



Proposed **Delivered**

Vis 2 - Scatterplot View



Proposed **Delivered**

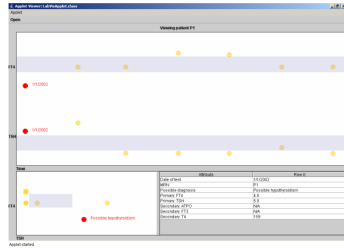
Vis 3 - Test Details

Analyte	17-Jan-03	04-Feb-03	01-Apr-03	Range
TSH	0.05	1.00	0.08	0.3-4.0
FT4	80	20	13	12-21
T4	159			
FT3				
ATPO	44			

Abn	Abn	Ref
Low TSH	0.3	0.3
High FT4	12.0	12.0
Low FT4	21.0	21.0
High T4	159	159
Low FT3	0.0	0.0
High FT3	150.0	150.0

Proposed **Delivered**

LabVis Interface



Visualization Details

- Colour and transparency
- Information density
- Linked highlighting
- Spatial layout

Usage scenarios

- Clinician: single patient data
 - Diagnostics: what's wrong now?
 - Monitoring history over time
- Clinical researcher: full dataset
 - Overall trends, outliers, ...

Thyroid test terminology

- Primary tests:
 - TSH (thyroid stimulating hormone)
 - FT4 (free thyroxine)
- Relationship determines likely diagnosis
- Secondary tests
 - T4, FT3, ATPO, ...
 - Used to confirm some diagnoses

Demo!

- Clinician diagnostic scenario

Evaluation

- Informal cognitive walkthrough
 - Domain expert user: Dr. Wes Schreiber
 - Non-expert users
- Results
 - Linked highlighting, colour cues helpful
 - Some suggestions for detail visualization
 - Overall: easy to use, intuitive



Summary

- LabVis: rapid, intuitive visualization and interpretation of medical laboratory test results

