

XIIes JOURNÉES DE GASTRO-ENTEROLOGIE D'AFRIQUE  
FRANCOPHONE - JGAF -  
*Yaounde congress (October 2009)*

XXe CONGRES NATIONAL DE LA SOCIETE CAMEROUNAISE DE GASTRO-  
ENTEROLOGIE

*22, 23 et 24 Octobre 2009 – Yaoundé – HILTON*



## General overview - Value Overview

- ◆ For HIV/Hepatitis specialists, an advanced technology combining:
  - cohort databases,
  - individual patient treatment histories,
  - interpretation of resistance profiles and
  - national guidelines, which facilitates personalized therapeutic decisions

*The unmet need is not for a generation of additional data, but for an analysis and reporting system that enables and leads to optimized treatment and monitoring decisions*



# Summary

- ◆ General overview
- ◆ TherapyEdge
- ◆ ViroScore SUITE
- ◆ Hepatitis modules
- ◆ Partners



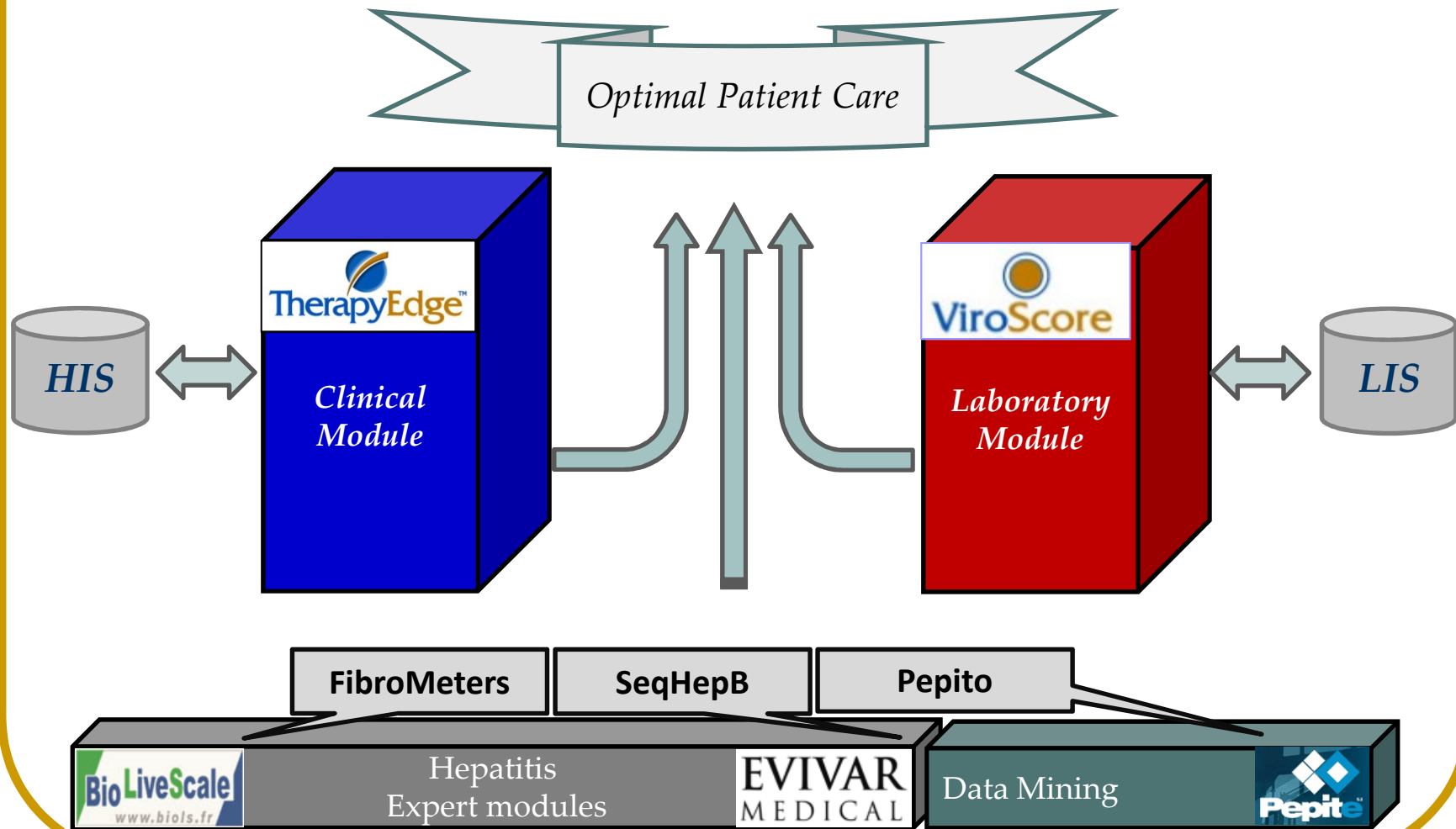
# General overview – The TherapyEdge Box



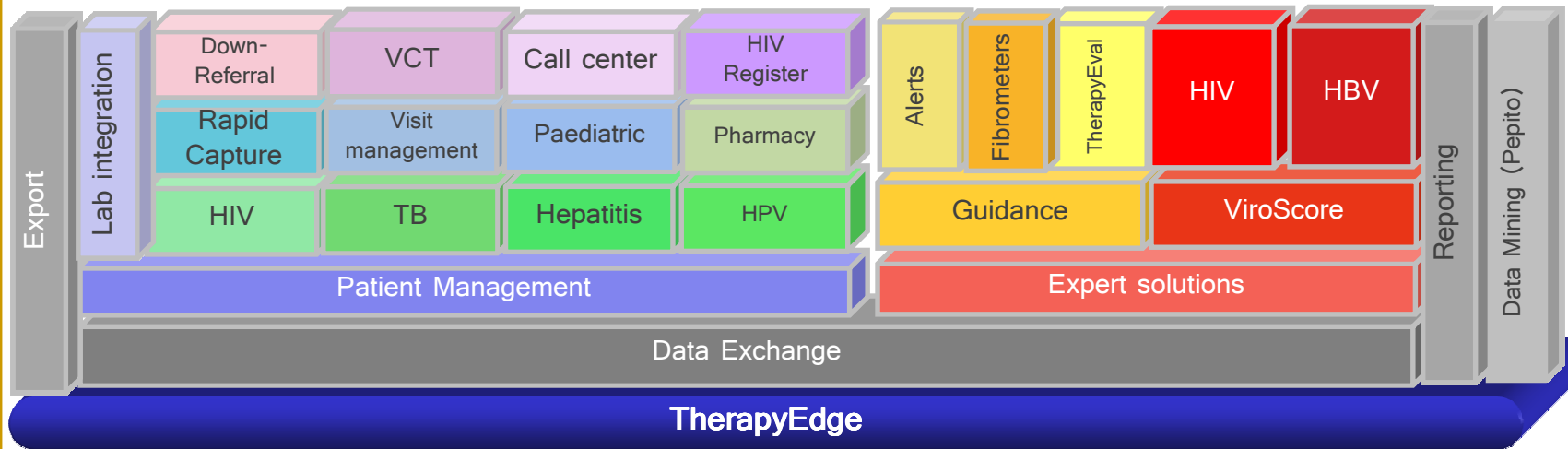
- ◆ “Turn key” solution to install and open new site
- ◆ Patient identification with fingerprint
- ◆ Laboratory tests and workflow stations with bar coding
- ◆ Laboratory tests results integration using HL7 protocols
- ◆ Disease management in HIV, hepatitis & liver diseases, tuberculosis, HPV & cervical cancer
- ◆ Automated data collection with electronic forms, fax, email and paper (95% coverage)



# General overview – The TherapyEdge Solution



# TherapyEdge main modules & solutions



# Summary

- ◆ General overview
- ◆ TherapyEdge
- ◆ ViroScore SUITE
- ◆ Hepatitis modules
- ◆ Partners



# TherapyEdge - a Comprehensive Medical Software

- ◆ Specific forms and sections for:
  - HIV
  - Hepatitis (B, C...)
  - Tuberculosis
  - HPV and cervical cancer
- ◆ But ability to follow and monitor any specific conditions:
  - WHO-ICD10 for medical conditions
  - WHO-ATC for drugs prescribed
  - LOINC for laboratory tests
- ◆ Push-button reporting for:
  - Reporting to donors & stakeholders (US government, global funds) : Pefar...
  - Clinical & Adverse events

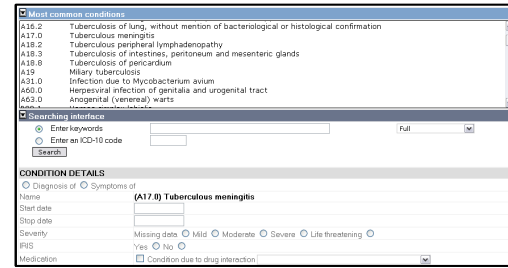


# TherapyEdge – Key features



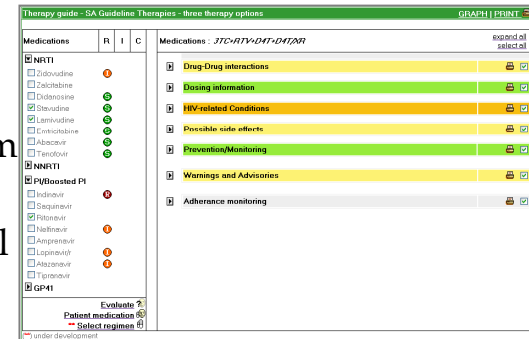
Complete patient chart

- Demographics
- Labs results
- Treatments
- Clinical conditions
- Visits
- ...



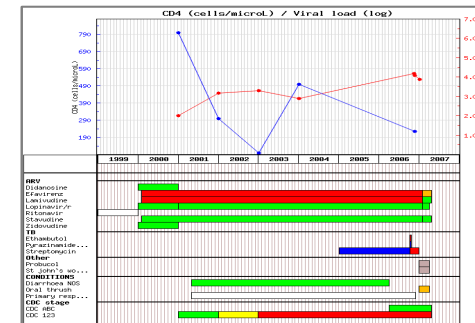
Decision support

- Real time alert system
- Evaluate therapies through TherapyEval



Data exchange / output

- Strong reporting (Pepfar...)
- Printouts / graphs
- Query builder
- HL7 / XML / CSV data exchange



# TherapyEdge – Data analysis for Personalized therapeutic solutions: TherapyEval module



Therapy guide - SA Guideline Therapies - three therapy options GRAPH | PRINT

Medications	R	I	C	Medications : IDV+3TC+ZDV <span style="float: right;">expand all select all</span>	
<input checked="" type="checkbox"/> <b>NRTI</b>				<input type="checkbox"/> Drug-Drug interactions	<input type="checkbox"/>
<input checked="" type="checkbox"/> Zidovudine <span style="color: red;">!</span>				<input type="checkbox"/> Dosing information	<input type="checkbox"/>
<input type="checkbox"/> Zalcitabine <span style="color: green;">\$</span>				<input type="checkbox"/> HIV-related Conditions	<input type="checkbox"/>
<input type="checkbox"/> Didanosine <span style="color: green;">\$</span>				<input type="checkbox"/> Possible side effects	<input type="checkbox"/>
<input type="checkbox"/> Stavudine <span style="color: green;">\$</span>				<input type="checkbox"/> Prevention/Monitoring	<input type="checkbox"/>
<input checked="" type="checkbox"/> Lamivudine <span style="color: green;">\$</span>				<input type="checkbox"/> Warnings and Advisories	<input type="checkbox"/>
<input type="checkbox"/> Emtricitabine <span style="color: green;">\$</span>				<input type="checkbox"/> Adherence monitoring	<input type="checkbox"/>
<input type="checkbox"/> Abacavir <span style="color: green;">\$</span>					
<input type="checkbox"/> Tenofovir <span style="color: green;">\$</span>					
<input checked="" type="checkbox"/> <b>NNRTI</b>					
<input checked="" type="checkbox"/> <b>PI/Boosted PI</b>					
<input checked="" type="checkbox"/> Indinavir <span style="color: red;">R</span>					
<input type="checkbox"/> Saquinavir <span style="color: red;">!</span>					
<input type="checkbox"/> Ritonavir <span style="color: red;">!</span>					
<input type="checkbox"/> Nelfinavir <span style="color: red;">!</span>					
<input type="checkbox"/> Amprenavir <span style="color: red;">!</span>					
<input type="checkbox"/> Lopinavir/r <span style="color: red;">!</span>					
<input type="checkbox"/> Atazanavir <span style="color: red;">!</span>					
<input type="checkbox"/> Tipranavir <span style="color: red;">!</span>					
<input checked="" type="checkbox"/> <b>GP41</b>					
<b>Evaluate ?</b>					
Patient medication					
** Select regimen					

(\*) under development

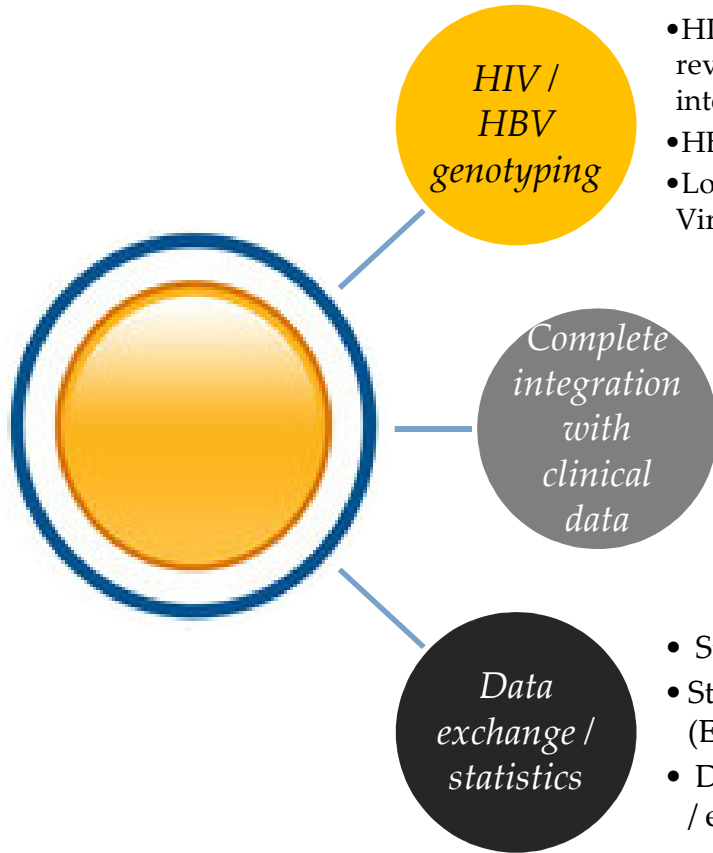


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- ◆ ViroScore SUITE
- ◆ Hepatitis modules
- ◆ Partners



# ViroScore SUITE – Key features



HIV / HBV genotyping

Complete integration with clinical data

Data exchange / statistics

- HIV genotyping : protease, reverse transcriptase, integrase, gp41, gp120
- HBV genotyping
- Longitudinal genotyping : ViroScorer+PLUS

- Link genotypes with real patient charts
- Combine clinical / virological data

- Strong reporting
- Statistics tools (EpiVisor...)
- Data exchange / export

Print report (fax)      Print report (color)  
 Send by mail      Quality control  
 Retrieve XML      PDF report

ABI/TE ID: TEST3  
 Your sample ID: Missing data      Type of report: Initial  
 Your patient ID: Missing data

Type of sample: Missing data  
 Analysis: RT-PROT      Genotyping method: Missing data  
 Date report edition: 19-Nov-2008, 14:40:36      Date of sample: 2002-02-02  
 Data report version: 7.9      Subtype: S (94.93 % similarity)

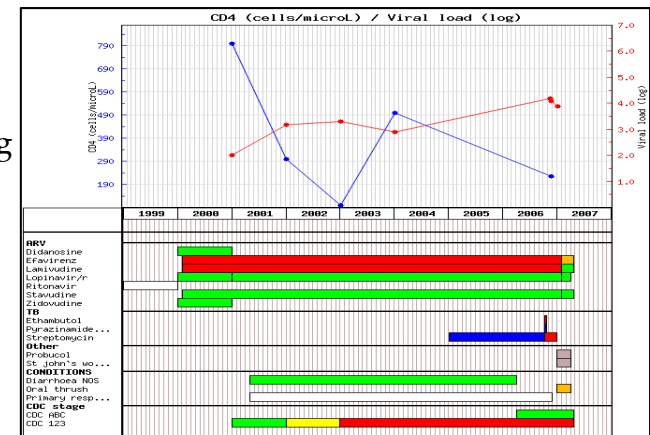
All Mutations Detected (HXB2 reference Sequence) Resistance mutations in bold

Reverse transcriptase: T27S, T39A, K43E, K49R, **K101E**, I142V, **Y181C**, **G190A**, G195E, L210W, L214F, T215V, V245K, P272A, P277K, I293V

Protease: V31, L101, S37N, **I54V**, L63P, H89R, A71V, G73S, **I84V**, L90M

Class	Drug	*ABCs 17-2008-07	*CCCs v7.1-2007/06/08	*INSTIs v4.3.4-2008-02-06
NRTI	Zidovudine	R	I	I
	Didanosine	S	S	I
	Stavudine	R	S	I
	Lamivudine	S	S	S
	Emtricitabine	S	S	S
NNRTI	Abacavir	S	S	I
	Tenofovir	S	S	I
	Nevapirine	<b>R</b>	R	R
	Delamanvir	not available	R	R
	Efavirenz	R	R	R
PI/Boosted PI	Etravirine	R	R	R
	Indinavir	not available	not available	not available
	Indinavir/	not available	R	R
	Saqinavir/	R	R	R
	Saqinavir/	R	R	R
PI/Boosted PI	Essamphenavir/	R	R	R
	Lopinavir/	R	R	R
	Ritonavir/	R	R	R
	Tipranavir/	S	R	R
	Darunavir/	S	S	I

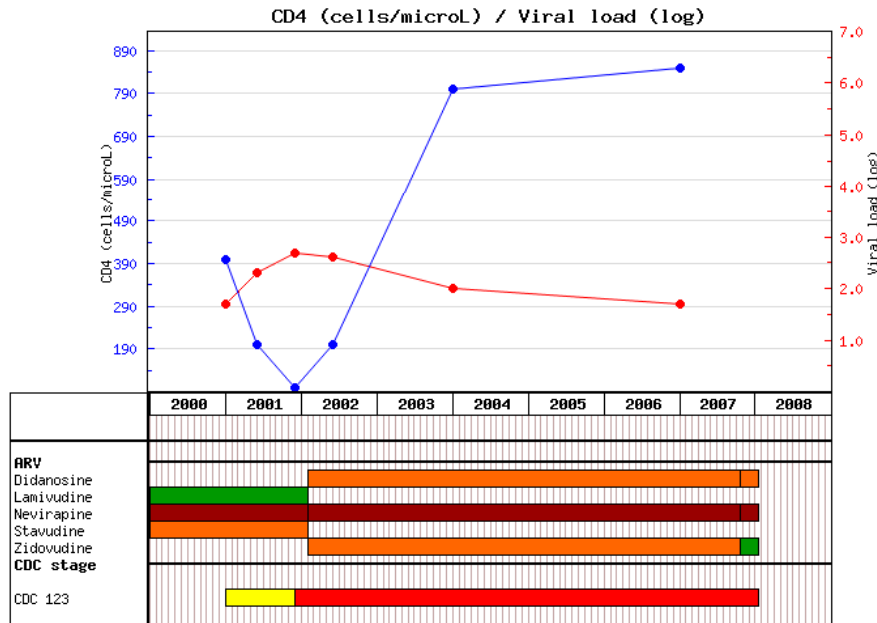
not available      S      I      R





# ViroScore SUITE – Integration with TherapyEdge

*Patient summary graph*



*TherapyEval*

<input checked="" type="checkbox"/> <b>NRTI</b>		
<input checked="" type="checkbox"/> Zidovudine	S	✓
<input type="checkbox"/> Zalcitabine		✓
<input checked="" type="checkbox"/> Didanosine	I	✓
<input type="checkbox"/> Stavudine	S	✓
<input type="checkbox"/> Lamivudine	R	✓
<input type="checkbox"/> Emtricitabine	R	✓
<input type="checkbox"/> Abacavir	I	✓
<input type="checkbox"/> Tenofovir	S	✓
<input checked="" type="checkbox"/> <b>NNRTI</b>		
<input checked="" type="checkbox"/> Nevirapine	R	✓
<input type="checkbox"/> Delavirdine	R	✓
<input type="checkbox"/> Efavirenz	R	✓
<input type="checkbox"/> Etravirine	S	✓
<input type="checkbox"/> <b>PI/Boosted PI</b>		
<input type="checkbox"/> <b>GP41</b>		
<input type="checkbox"/> <b>II</b>		



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# Hepatitis modules - Fibrometers

*FibroMeters are the best non-invasive performing tests for the diagnosis of significant fibrosis*




*Fully integrated with TherapyEdge*

- ◆ Receive Fibrometers results in real time
- ◆ Direct Fibrometers order system
- ◆ Algorithms regularly updated
- ◆ Determine Area/Activity/Score of Fibrosis
- ◆ Reliable personal diagnosis
- ◆ Reasonable cost



# Hepatitis modules – Fibrometers report



**BioLiveScale**  
www.biols.fr

**FibroMeter V**

**LABM BIOLIVESCALE**  
Rue Haute de Reculée  
49000 ANGERS France  
Tel: 0241360719 Fax: 0241361894

FibroMeter Ref.: 0904-1407-49B      Prescriber: Dr. EXAMPLE Physician  
 Patient: James Jones      University hospital  
 Date of birth: 01/01/1961      FR 49100 ANGERS France  
 Date of the blood take: 19/02/2008      Patient's age: 47.1 yrs      Gender: M

**Blood tests results**

Markers	Values	Comments
Platelets	339 G/l	The expert system has not found any marker potentially source of false positive or negative.
Prothrombin index	88 %	
ALT	20 UI/l	
AST	29 UI/l	
Bilirubin	7 µmol/l	
GGT	81 UI/L	
Urea	3.10 mmol/l	
Hyaluronic acid	58 µg/L	
Alpha 2 macroglobulin	2.57 g/l	


**FibroMeter results**

FibroMeter, score of fibrosis (scale: 0 to 1): **0.43**  
 Is equivalent to the following Metavir stage (scale: 0 to 4): **F1/2**  
(See corresponding meter)

Results should be interpreted in accordance with the clinical past-history of the patient.

Additional results:

Confirmed presence of liver fibrosis.

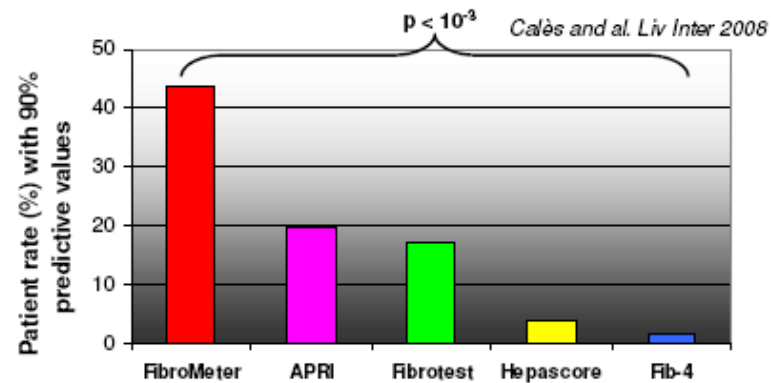


Score of fibrosis

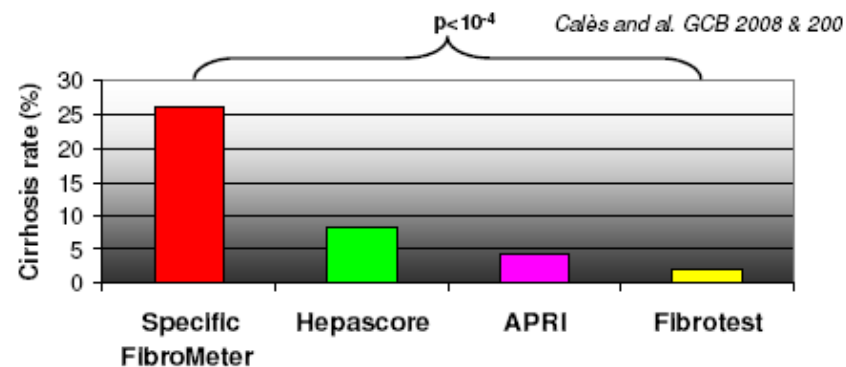


# Hepatitis modules – Fibrometers : Reliable Prediction and Diagnosis

## Prediction of significant fibrosis

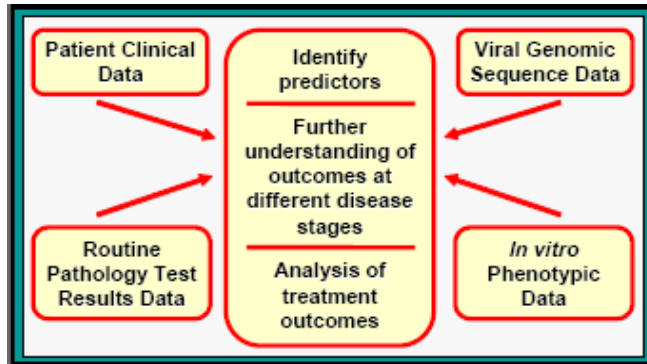


## Rate of detected cirrhosis by predictive positive values $\geq 95\%$



# Hepatitis modules – SeqHepB

## A Sequence Analysis Program and Relational Database System for Chronic Hepatitis B



SeqHepB Virtual Virology System

Home About Us Contacts Articles Articles

Patient ID: Patient1 Sample ID: 12345678 Sample Date: 28/03/2006

Region Submitted: RT Identify Genotype only:

NUCLEOTIDE SEQUENCE

```

TCCAAATTTGCTGGCTATCGTTGGATGTGCTGCGGCGTTTATGATATTCCTTCA
TCCTGCTGCTATGCGCTCATCTCTGTGGTCTCTGGACTACCAAGGTATGTTGCC
OTTTGCTCTACTCCAGGAACATCACTCAACGACGGGACCATGCAAGACTTGCAC
GATTCCTCTCAAGAACCTCTATGTTCCCTCTGTTGCTTACAAACCTTGGAGG
GAACTGCACTTGTATCCCATCCCATCATCTCGGCTTTCGAAALTTCTATGGAG
TGGGCTCAGTCCGTTTCTGATGGCTAGTTACTAGTGCATTTGTCAGTGGTTCG
AGGCGTTTCCCGCACTGTTGGCTTTCAGTTATGTTGATGTTGATTTGGGGCCAA
GTCTGTACACATCTTGGTCCCTTTTACCTTATTACCAATTTCTTTTATCTTGG
    
```

Forced Standard:

Reset Submit

Victorian Infectious Diseases Reference Laboratory  
10 Wreakyn Street, North Melbourne, Victoria 3051, Australia  
Postal Address: Locked Bag 919, Carlton 3053, Australia  
Tel: 61 3 9342.2602, Fax: 61 3 9342.2665  
Email: seqhepb.coordinator@mh.org.au

Copyright: Melbourne Health, 2002  
Analysis program and website provided by:  
Last Recort Support Pty Ltd  
support@lrsupport.com.au

**SeqHepB RESULT** at: 15:26:35 28 Mar 2006 rev:200405-01 ver:9.2 Message ID:HB90003212

**Response to:** yuenl - Lilly Yuen - SeqHepB Management Group

**Patient:** Patient 1 - Unknown Patient,

**Sample Date:** 28/03/2006 **Sample ID:** 12345678

The sequence data entered was compared with the SeqHepB database.

The sequence matched **HBV Genotype C**, HBV Serotype adw

Your base-pair raw data has been translated into amino acid data for consistent reporting.

**Significant Mutation Findings:**

Sequence analysis of the HBV polymerase region has detected a RT\_L180M (L526M) and RT\_M204V (M550V) change consistent with lamivudine resistance and also famciclovir resistance.

**HBV Gene Analysis:**

The amino acid data entered matched with the amino acids in the following genes:

Gene Name	Start	in Gene
POL	421	
S	67	

**Insertions, Deletions and Mutations:**

The following nucleotide and amino acid mutations were detected:

```

AA Mutation:L[106]X ( L[526]X ) RT_L180M (Reverse Transcriptase)
AA Mutation:M[130]V ( M[550]V ) RT_M204V (Reverse Transcriptase)
NT RT_C538A (Reverse Transcriptase)
NT RT_A610G (Reverse Transcriptase)
AA PreS1_I369M | PreS2_I230M | HBsAg_I195M (Hep B Surface Antigen)
End of Indel Table.
    
```



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- ◆ Data mining (PEPITO)
- ◆ Hepatitis modules
- ◆ **Partners**



# Major International and National Research programs using ViroScore for HIV drug resistance management

-  Spread
-  Watch
-  Euro HIV Resistance
-  TCeLS
-  TASER
-  PASER



# Partners

## Licensing partners



## Research and technical collaborators



# Thank you

Contacts:

## [www.therapyedge.com](http://www.therapyedge.com)

- ◆ Europe: Ronan Boulme : [ronan@therapyedge.com](mailto:ronan@therapyedge.com), (+33 615 41 53 88)
- ◆ USA: Chalom Sayada : [chalom@therapyedge.com](mailto:chalom@therapyedge.com), (+1 919 386-8041)
- ◆ South Africa: Ron Snapper : [ron@therapyedge.com](mailto:ron@therapyedge.com), (+27 861 115 786)
- ◆ Spain: Oriol Palau Fernandez : [oriol@therapyedge.com](mailto:oriol@therapyedge.com), (+34 667 665 886)

