

Health Design Challenge: Reinventing the Patient Medical Record

THE PROBLEM

Electronic Medical Records (EMR) are often difficult to read by a patient. Lack of adequate hierarchies and visual cues make it difficult for readers to understand the content without having to learn how to read the record. Current health issues of importance are often not highlighted, leaving the patient overwhelmed with information.

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----- MY HEALTHEVET PERSONAL INFORMATION REPORT -----
*****CONFIDENTIAL*****
Produced by the Blue Button (v12)
02 Dec 2011 @ 1023

This summary is a copy of information from your My HealtheVet Personal Health Record. Your summary contains information that you entered and may also include a copy of some of the information in your VA medical record. If it does, it will include in My HealtheVet. Please let your health care team know if you have questions about your health information. For some Veterans, information from the Department of Defense (DoD) is available. You will see this in VA Blue Button as DoD Military Service Information.

Name: MHVVETERAN, ONE A Date of Birth: 01 Mar 1948
----- DOWNLOAD REQUEST SUMMARY -----
System Request Date/Time: 02 Dec 2011 @ 1023
User Request Type: Download all of my available data from My HealtheVet
File Name: mhv_MHVETERAN_20111202.txt

Data Types Selected:
My HealtheVet Account Summary
Demographics
Health Care Providers
Treatment Facilities
Health Examinations
VA Wellness Reminders
VA Appointments (Future)
VA Appointments (Limited to past 2 years)
VA Medication History
Medications and Supplements
VA Allergies
Allergies and Adverse Reactions
Medical Events
Immunizations
VA Laboratory Results
Labs and Tests
Vitals and Readings
Family Health History
Military Health History
DoD Military Service Information

----- MY HEALTHEVET ACCOUNT SUMMARY -----
Source: VA

Authentication Status: Authenticated
Authentication Date: 19 Aug 2010
Authentication Facility ID: 979
Authentication Facility Name: SLC10 TEST LAB

VA Treating Facility Type
DAYT29 M&ROC

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Sample data from Blue Button

OUR SOLUTION

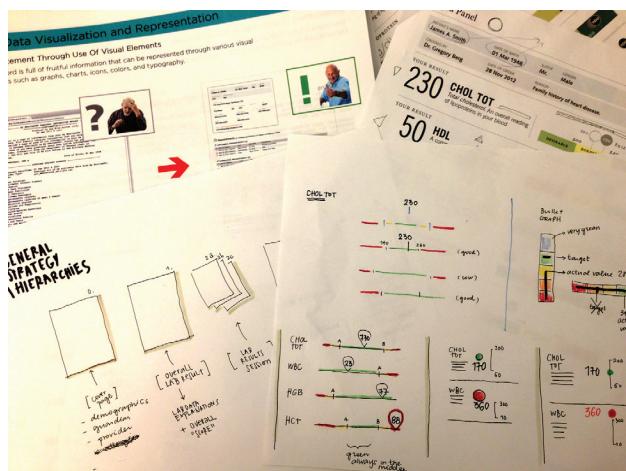
For this design challenge, the Parsons Institute for Information Mapping (PIIM) approached the problem from both a “macro” and “micro” perspective. We started by conceptualizing the domain of the medical record as a whole. Utilizing the fields and sections found in the Continuity of Care Document, we reorganized the structure of the information to better clarify and highlight data of vital importance to the patient. Working with our Medical Informatics Specialist, each lab result was thoroughly investigated and redesigned using preferred elements for typography, color, and graphs. The result is a medical record that is easy to understand and discuss with a primary care provider. The design also puts medical information in reach for those who may have limited English proficiency or low literacy.

Based on the description of target audience, this medical record is designed with the following in mind:

1. Written medical information is simplified;
2. The designs visual cues highlight important information through iconography and graphs;
3. The record compatible with a variety of devices (desktops, mobile devices, tablets) and is functional in both color and black and white print.

DESIGN EXPLORATIONS

Overall visual concepts are explored further at the end of this document and detail additional styles and iconography sets.



MEDICAL HEALTH RECORD

ISSUED DATE
30 Nov 2012

YOUR PROFILE

Ellen Ross



DATE OF BIRTH
7 December 1972

GENDER
Female

MARITAL STATUS
Married

PHONE
415-555-1229

ADDRESS
17 Daws Road
Portland OR 97006

ETHNICITY
Asian

LANGUAGE SPOKEN
English

GUARDIAN

SISTER
Martha Shan

PHONE
415-555-1229

ADDRESS
1357 Amber Drive
Beaverton OR 97006

PROVIDER

Ashby Medical Center

PHONE
415-555-1229

ADDRESS
1002 Healthcare DR
Portland OR 97266

IMPORTANT NOTES



Allergies

You have 8 known allergies.

NAME	SEVERITY	REACTION
Bee Stings	Severe	Anaphylactic Shock
Dogs/pets	Severe	Anaphylactic Shock
Peanuts	Severe	Anaphylactic Shock
Penicillin	Moderate to severe	Shortness of breath
Codeine	Moderate	Hives
Latex	Moderate	Hives
Shellfish	Moderate	Hives
Soy	Moderate	Hives



Immunizations

You have 2 upcoming immunizations.

NAME	DUE BY	NAME	DUE BY
Influenza Virus Vaccine	Dec 2013	Tetanus and Diphtheria Toxoids	Jan 2013
TYPE AND DOSE Intramuscular injection		TYPE AND DOSE Intramuscular injection	
VALUE / UNIT 50 / mcg		VALUE / UNIT 50 / mcg	
EDUCATION / INSTRUCTIONS Possible flu-like symptoms for 3 days		EDUCATION / INSTRUCTIONS Mild pain or soreness in the local area	



Plan of Care

You have 3 recommendations from your doctor.

NAME	PLANNED DATE	INSTRUCTIONS
Office consultation	1 DEC 2012	
Chest X-ray	15 DEC 2012	
Sputum Culture	8 JAN 2013	

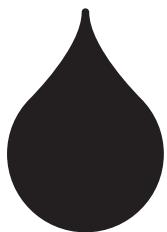


Lipid Panel

A Lipid Panel measures different parts of cholesterol in your blood. High cholesterol can lead to heart disease, so it is important to discuss abnormal test results with your healthcare provider.

YOUR RESULTS

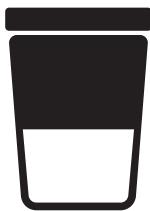
- CHOL TOT
- HDL
- LDL
- TRIG
- NON-HDL



Complete Blood Count

A Complete Blood Count is one of the most common blood tests. It is used as a measure of your overall health and can help your healthcare provider detect problems like anemia and infection.

- RBC
- WBC
- HGB
- HCT
- PLT
- MCV
- HGB A1C



Urinalysis

A Urinalysis evaluates a sample of your urine, and is used to detect problems with your kidneys, urinary tract infections, and diabetes. Urinalysis alone usually does not result in a medical diagnosis.

- Color
- Order
- Turbidity
- Specific Gravity
- Acidity/PH
- Glucose
- Ketones
- Leukoesterase
- Protein
- Bilirubin
- RBC
- Casts
- Crystals
- Bacteria
- Parasites
- Nitrites



Pap Smear

A Pap Smear is a screening test for cervical cancer in women. A swab from your cervix—the lower part of your uterus—is tested for abnormal cells.

- RBC

KEYS: ● Poor ● Borderline ● Normal ● Good

LAB RESULTS

Lipid Panel

PATIENT'S NAME
Ellen RossDATE OF BIRTH
7 Dec 1972ISSUED DATE
30 Nov 2012

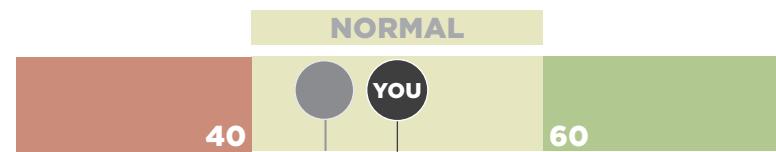
CHOL TOT: TOTAL CHOLESTEROL

230 mg/dLBORDERLINE HIGH
An overall reading of lipid particles in your blood.

HDL: HIGH DENSITY LIPOPROTEIN

50 mg/dL

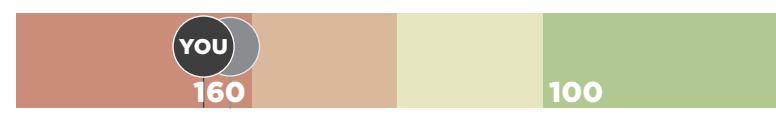
NORMAL

Known as the "good" cholesterol — higher is better.

LDL: LOW DENSITY LIPOPROTEIN

170 mg/dL

POOR

Known as the "bad" cholesterol — lower is better.

TRIG: TRIGLYCERIDES

80 mg/dL

GOOD

The chemical form of most fats found in foods.

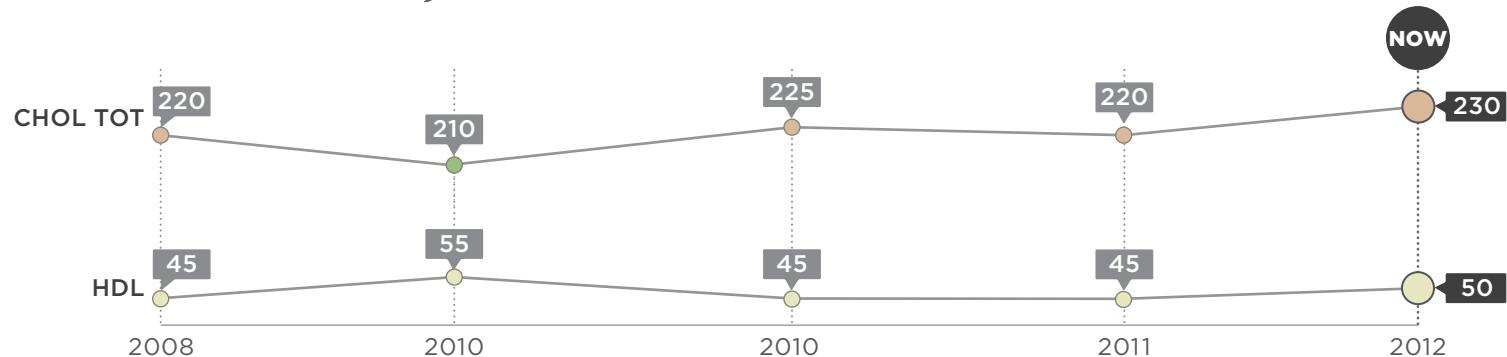
NON-HDL: NON-HIGH DENSITY LIPOPROTEIN

180 mg/dL

NORMAL

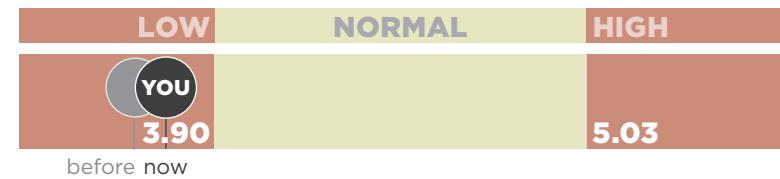
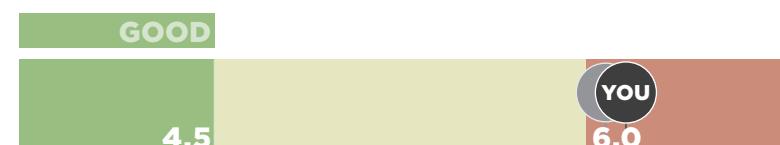
This is your total cholesterol minus your HDL, high density lipoprotein.

CHANGE OVER THE LAST 5 YEARS



NOTES

my doctor recommended regular exercise.

LAB RESULTS**Complete Blood Count**PATIENT'S NAME
Ellen RossDATE OF BIRTH
7 Dec 1972ISSUED DATE
30 Nov 2012**RBC: RED BLOOD CELL****3.7** M/uL**LOW***Red Blood Cell count is a component of a Complete Blood Count test.***WBC: WHITE BLOOD CELL****6** K/uL**NORMAL***White blood cells are part of the body's immune system.***HGB: HEMOGLOBIN****11** g/dL**LOW***The hemoglobin test measures the oxygen carrying capacity of the blood.***HCT: HEMATOCRIT****34** %**LOW***Hematocrit is the percent of blood made up of red blood cells.***PLT: PLATELETS****180** K/uL**NORMAL***Platelets are cell fragments needed for normal blood clotting.***MVC: MEAN CORPUSCULAR VOLUME****93** fL**NORMAL***Mean Corpuscular Volume is the average size of a red blood cell.***HGB A1C: GLYCOSYLATED HEMOGLOBIN****6.2** %**HIGH***Hemoglobin A1C is used to diagnose and manage diabetes.***NOTES**

MEDICATIONS**Active Medications (3)**PATIENT'S NAME
Ellen RossDATE OF BIRTH
7 Dec 1972ISSUED DATE
30 Nov 2012**IBUPROFEN 600MG TAB**

SIDE A

SIDE B



DIRECTIONS / NOTES

1 tablet by mouth
4 times a day with food
 every **4** hours

REASON FOR MEDICATION
For treatment of lower back pain.

POSSIBLE SIDE EFFECTS

- Headache
- Dizziness

GET MEDICAL HELP IF
*Experiencing chest pain, shortness of breath, and rapid weight gain.***INSULIN, GLARGINE, HUMAN 100 UNT/ML INJ**

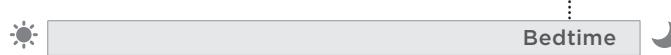
APPEARANCE



DIRECTIONS / NOTES

1 injection at bedtime

Inject 10 ml vial under the skin as directed for 28 days inject 25 units under the skin at bedtime do not mix with other insulins/discard open vials after 28 days.

REASON FOR MEDICATION
Reduce blood pressure.

POSSIBLE SIDE EFFECTS

- Headache
- Fatigue
- Nausea

GET MEDICAL HELP IF
*Experiencing itching skin, wheezing, and fast heart rate.***TERAZOSIN HCL 2MG CAPSULE**

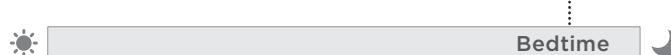
SIDE A

SIDE B



DIRECTIONS / NOTES

3 capsules before bed

REASON FOR MEDICATION
For treatment of symptoms of an enlarged prostate.

POSSIBLE SIDE EFFECTS

- Dizziness
- Headache
- Constipation
- Loss of appetite
- Fatigue

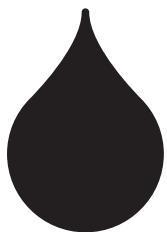


Lipid Panel

A Lipid Panel measures different parts of cholesterol in your blood. High cholesterol can lead to heart disease, so it is important to discuss abnormal test results with your healthcare provider.

YOUR RESULTS

- CHOL TOT
- HDL
- LDL
- TRIG
- NON-HDL



Complete Blood Count

A Complete Blood Count is one of the most common blood tests. It is used as a measure of your overall health and can help your healthcare provider detect problems like anemia and infection.

- RBC
- WBC
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- PLT
- MCV
- HGB A1C



Urinalysis

A Urinalysis evaluates a sample of your urine, and is used to detect problems with your kidneys, urinary tract infections, and diabetes. Urinalysis alone usually does not result in a medical diagnosis.

- | | |
|------------------|-----------|
| Color | Protein |
| Order | Bilirubin |
| Turbidity | RBC |
| Specific Gravity | Casts |
| Acidity/PH | Crystals |
| Glucose | Bacteria |
| Ketones | Parasites |
| Leukoesterase | Nitrites |



Pap Smear

A Pap Smear is a screening test for cervical cancer in women. A swab from your cervix—the lower part of your uterus—is tested for abnormal cells.

- RBC

KEYS: Poor Borderline Normal Good

LAB RESULTS

Lipid Panel

PATIENT'S NAME
Ellen RossDATE OF BIRTH
7 Dec 1972ISSUED DATE
30 Nov 2012

CHOL TOT: TOTAL CHOLESTEROL

230 mg/dL

BORDERLINE HIGH

An overall reading of lipid particles in your blood.

POOR BORDERLINE GOOD

240 200

now before

HDL: HIGH DENSITY LIPOPROTEIN

50 mg/dL

NORMAL

Known as the "good" cholesterol — higher is better.

NORMAL

40 60

LDL: LOW DENSITY LIPOPROTEIN

170 mg/dL

POOR

Known as the "bad" cholesterol — lower is better.

YOU 160 100

TRIG: TRIGLYCERIDES

80 mg/dL

GOOD

The chemical form of most fats found in foods.

200 150 YOU

NON-HDL: NON-HIGH DENSITY LIPOPROTEIN

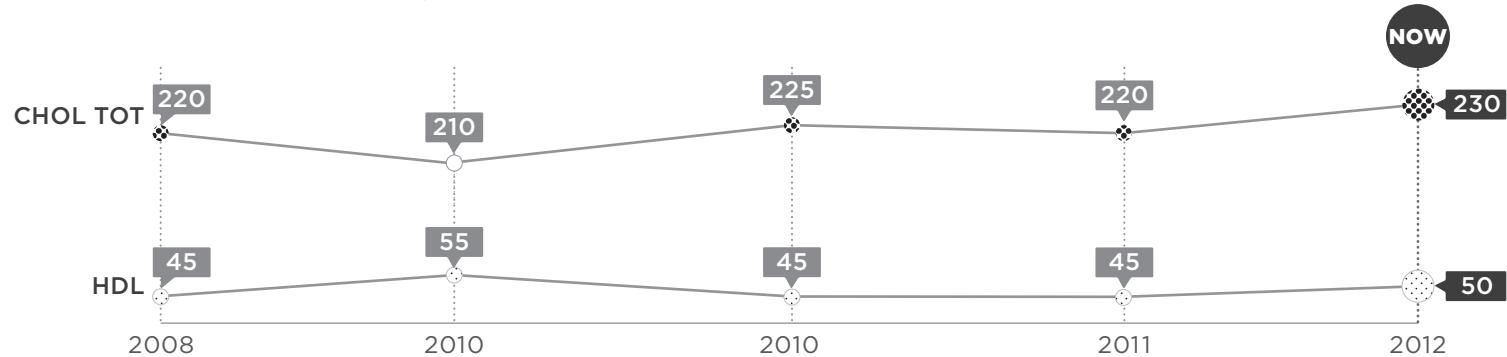
180 mg/dL

NORMAL

This is your total cholesterol minus your HDL, high density lipoprotein.

190 YOU

CHANGE OVER THE LAST 5 YEARS



NOTES

my doctor recommended regular exercise.

LAB RESULTS**Complete Blood Count**PATIENT'S NAME
Ellen RossDATE OF BIRTH
7 Dec 1972ISSUED DATE
30 Nov 2012**RBC: RED BLOOD CELL****3.7** M/uL

LOW

Red Blood Cell count is a component of a Complete Blood Count test.**NORMAL****HIGH**
5.03**WBC: WHITE BLOOD CELL****6** K/uL

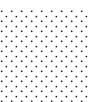
NORMAL

White blood cells are part of the body's immune system.**10.5****HGB: HEMOGLOBIN****11** g/dL

LOW

The hemoglobin test measures the oxygen carrying capacity of the blood.**15.5****HCT: HEMATOCRIT****34** %

LOW

Hematocrit is the percent of blood made up of red blood cells.**44.5****PLT: PLATELETS****180** K/uL

NORMAL

Platelets are cell fragments needed for normal blood clotting.**450****MVC: MEAN CORPUSCULAR VOLUME****93** fL

NORMAL

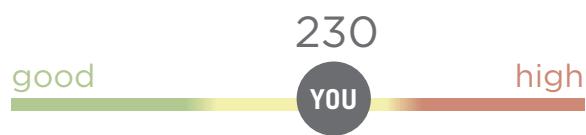
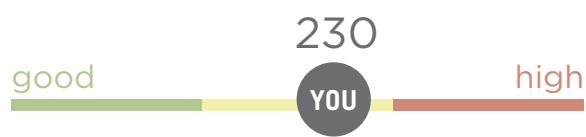
Mean Corpuscular Volume is the average size of a red blood cell.**98.3****HGB A1C: GLYCOSYLATED HEMOGLOBIN****6.2** %

HIGH

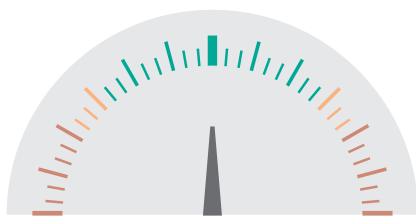
Hemoglobin A1C is used to diagnose and manage diabetes.**6.0****NOTES**

Exploration of Graphs

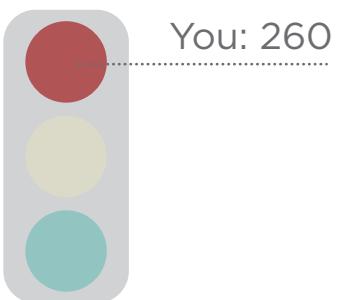
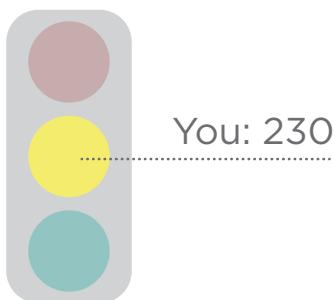
1. CONDENSED BAR GRAPH



2. GAUGE/DIAL



3. TRAFFIC LIGHT



Exploration of Medications display

MEDICATIONS

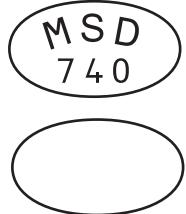
1. IMAGE



2. IMAGE + OVERLAY TEXT



3. ICON



INTAKE TIMELINE SOLUTIONS

1. PLAIN TEXT

DIRECTIONS/NOTES

Take one tablet by mouth four times a day with food every 4 hours.

- ☀ 10:00AM 1 capsule with meal.
- ☀ 2:00PM 1 capsule with meal.
- 🌙 6:00PM 1 capsule with meal.
- 🌙 10:00PM 1 capsule with meal.

2. COLORIZED TIME SCALE



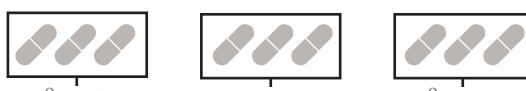
4. TIME SCALE + ICONS

3. PLAIN TEXT VER.2

DIRECTION
🌙 6:00PM

3 capsules before bed

Take 3 capsules around each time frame



The dotted line scale shows 24 hours.

Exploration of icons for side effects

ANXIETY



CONSTIPATION



DIZZINESS



DROWSINESS



FATIGUE



GAS



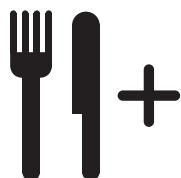
HEADACHE



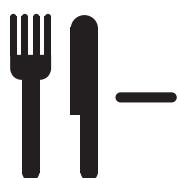
HEARING LOSS



INCREASED APPETITE



LOSS OF APPETITE



NAUSEA



PAIN



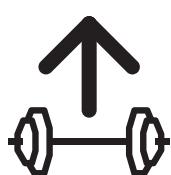
STOMACH PAIN



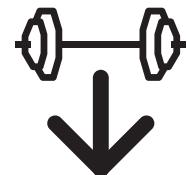
SUICIDALITY



WEIGHT GAIN



WEIGHT LOSS

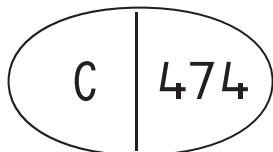


Exploration of Medications display

MEDICATIONS PANEL

METFORMIN HCL 1000MG TAB

SIDE A

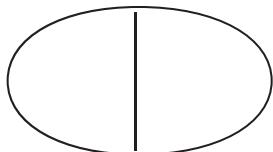


DIRECTIONS/NOTES

Take one tablet by mouth twice a day with meals.

- ☀ 10:00AM 1 tablet with meal.
- 🌙 6:00PM 1 tablet with meal.

SIDE B



REASON FOR TAKING

Treat type 2 diabetes.

PREScriber

Ashby Medical Center

ATC CODE

A10BD07

POSSIBLE SIDE EFFECTS

headache
gas
muscle pain
dizziness
nausea

SIMVASTATIN 20 MG TAB

SIDE A



DIRECTIONS/NOTES

Take one tablet by mouth at bedtime.

- 🛏 1 tablet at bedtime.

REASON FOR TAKING

Treat cholesterol level.

PREScriber

Ashby Medical Center

ATC CODE

C10BX04

POSSIBLE SIDE EFFECTS



Exploration of Lab Results display

ALL NUMBERED TEXT ARE IN BLACK

YOUR RESULT

50 HDL

A component of total cholesterol,
high density lipoprotein is called
“the good cholesterol”



NORMAL AND ABNORMAL VALUES ARE IN THEIR RESPECTIVE COLORS.

WBC: WHITE BLOOD CELL

6 K/uL

White blood cells are part of the body's immune system.



HGB: HEMOGLOBIN

11 g/dL

The hemoglobin test measures the oxygen carrying capacity of the blood.



NORMAL VALUES ARE SET IN GREY, ABNORMAL VALUES IN COLOR.

WBC: WHITE BLOOD CELL

6 K/uL

NORMAL *White blood cells are part of the body's immune system.*



HGB: HEMOGLOBIN

11 g/dL

TOO HIGH *The hemoglobin test measures the oxygen carrying capacity of the blood.*



ABOUT US

Since 2008, the Parsons Institute for Information Mapping has been designing solutions for improving the clarity of medical information through better design. A research institute of The New School in New York City, PIIM specializes in creating knowledge through better design.

In 2012 PIIM announced plans for the first full GUI solution and prototype for the Patient-Centered Medical Home. The project will be released through the Open Source Electronic Health Record Agent (OSEHRA) initiative. Our staff consists of information designers, theorists, software programmers and medical informatics researchers. For more information about us or any of our open source products, please visit <http://piim.newschool.edu> or <http://piim.newschool.edu/healthboard>.

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FOR INFORMATION MAPPING

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