

I²PRO 372

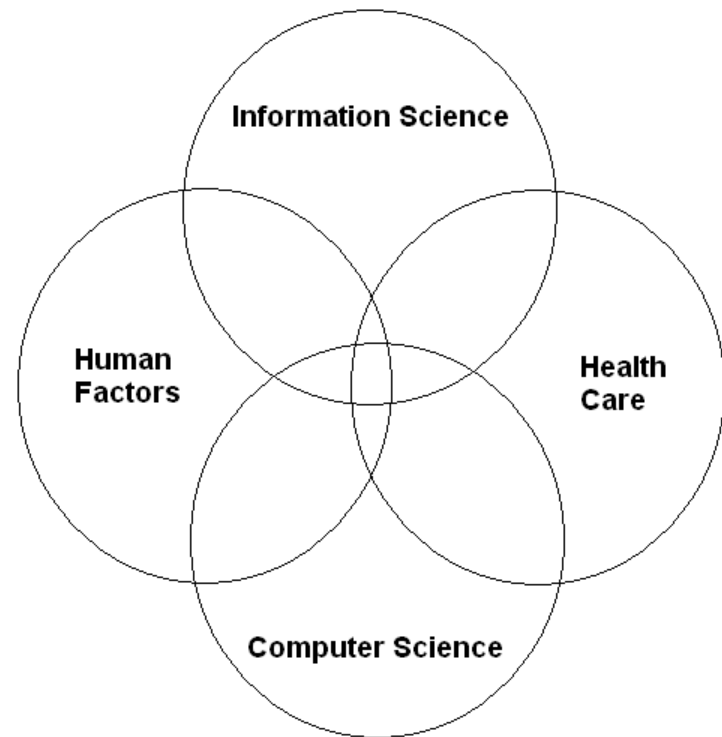
I²PRO Day Presentation: December 3, 2004

Introduction

- What is Medical Informatics?
- Scope, size of Medical Informatics
- What is Health Care?
- What problems currently exist in Health Care?
- Information technology & Health Care

Fields In Medical Informatics

- **Four Main Fields:**
 - Information Science
 - Computer Science
 - Human Factors
 - Health Care



Cognition

- Use of information regarding patient care
- Need of more accurate and current information
 - Direct observation
 - Paper printouts
 - Electronic displays
- Helps clinicians further evaluate proper patient care

Ecological Displays

- What are ecological displays?
- How is it useful to clinicians?
- What are some strengths of displays?
- What are some drawbacks?

Ecological Displays



Patient Vital Signs Display

Ecological Displays



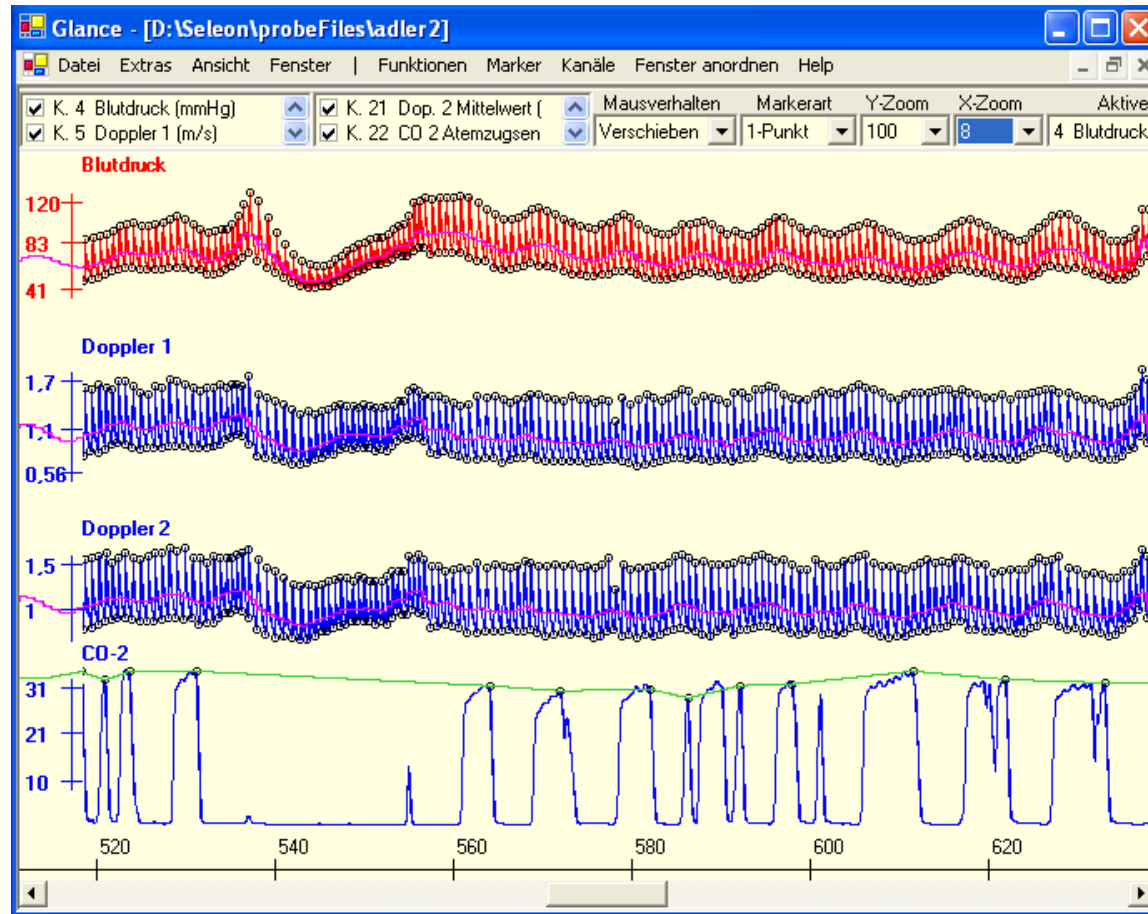
Pulmonary Function Display

Ecological Displays



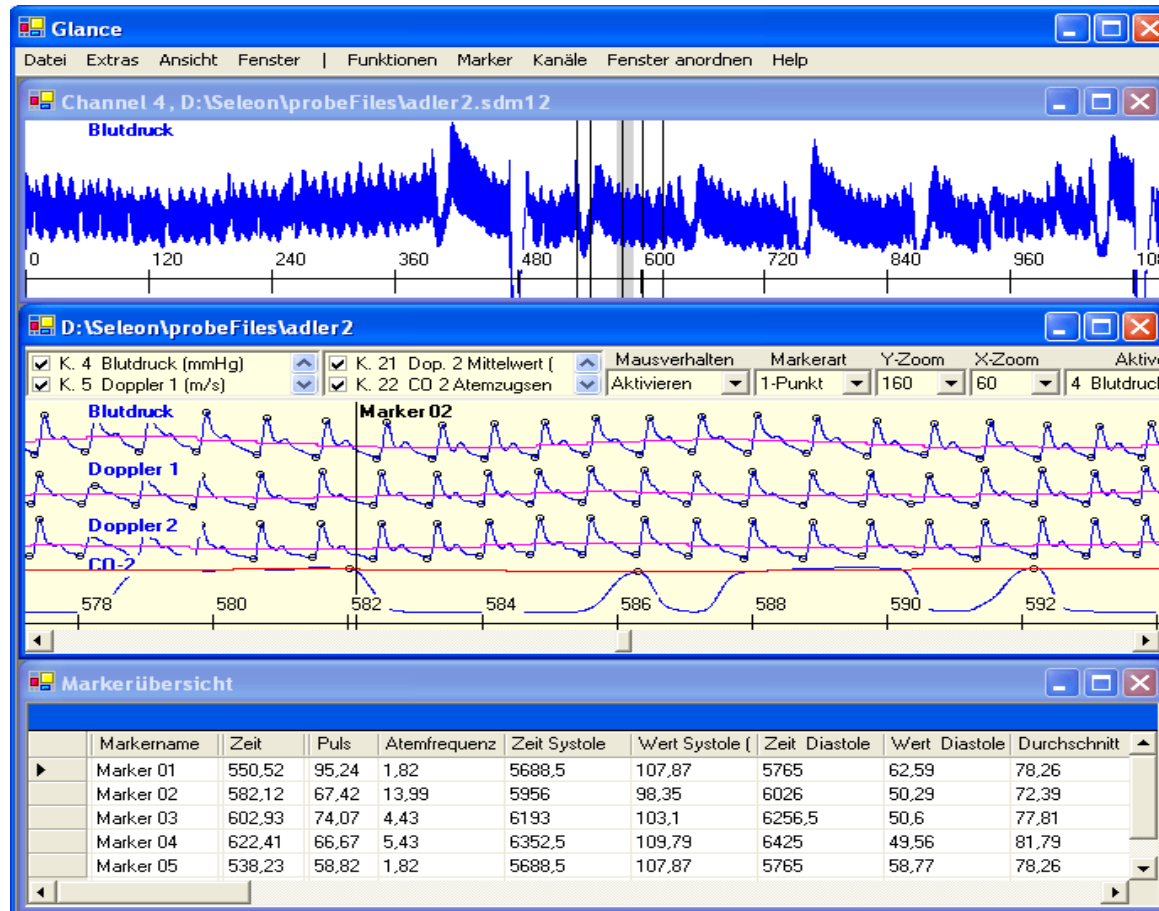
Respirator Display

Ecological Displays



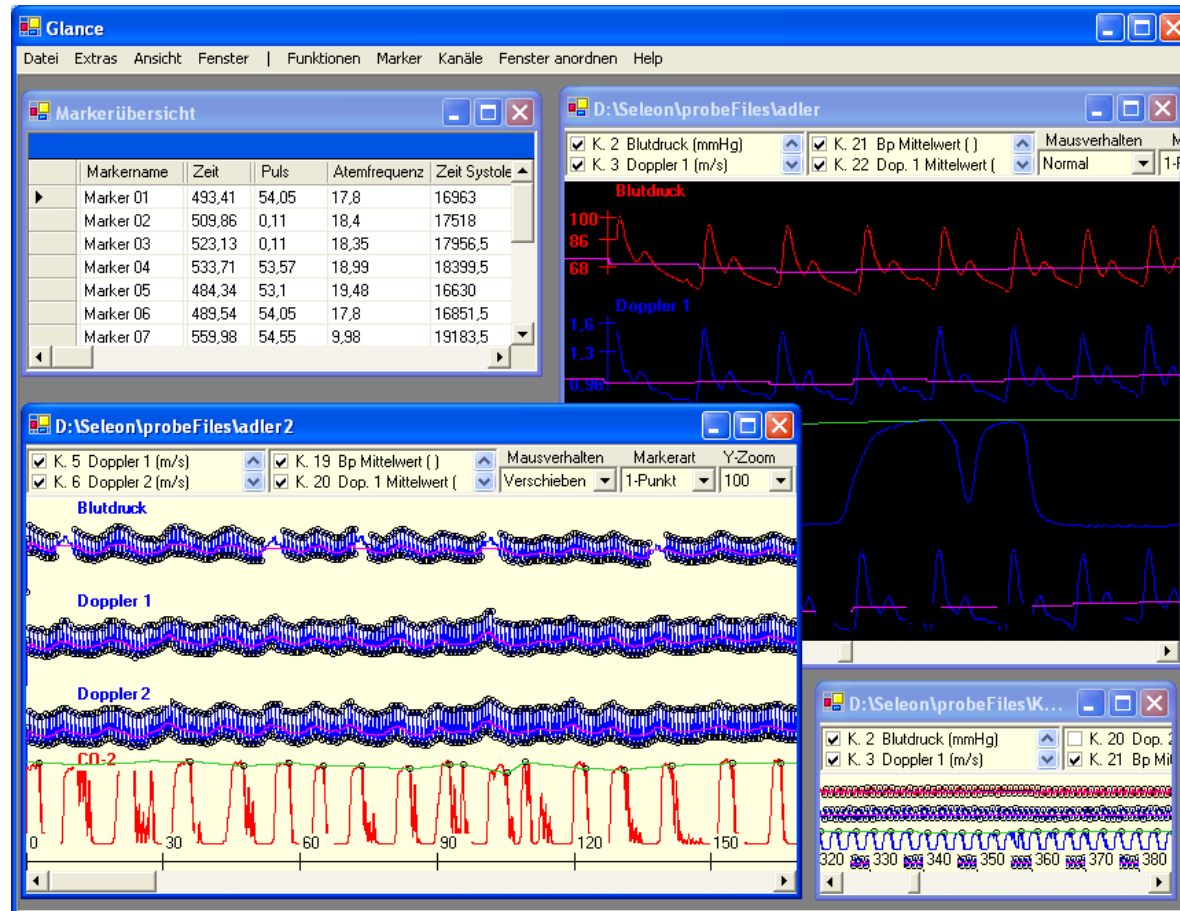
Blood Pressure Display

Ecological Displays



Breathing Display With Markers

Ecological Displays



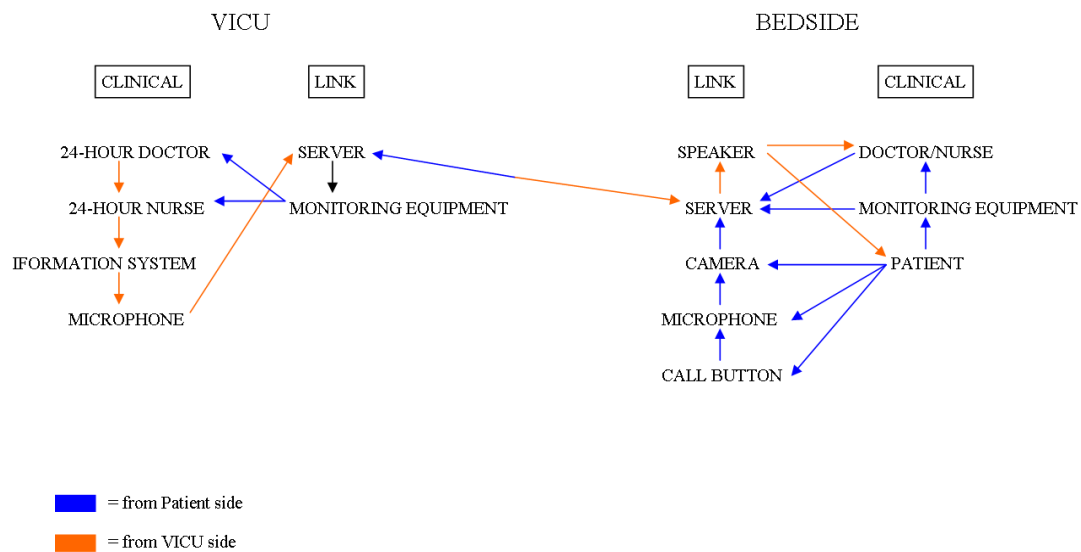
Multi Document Interface Display

ICU & VICU

- What is the ICU?
- What is the VICU?
 - How does it work?
 - Strengths and Weaknesses

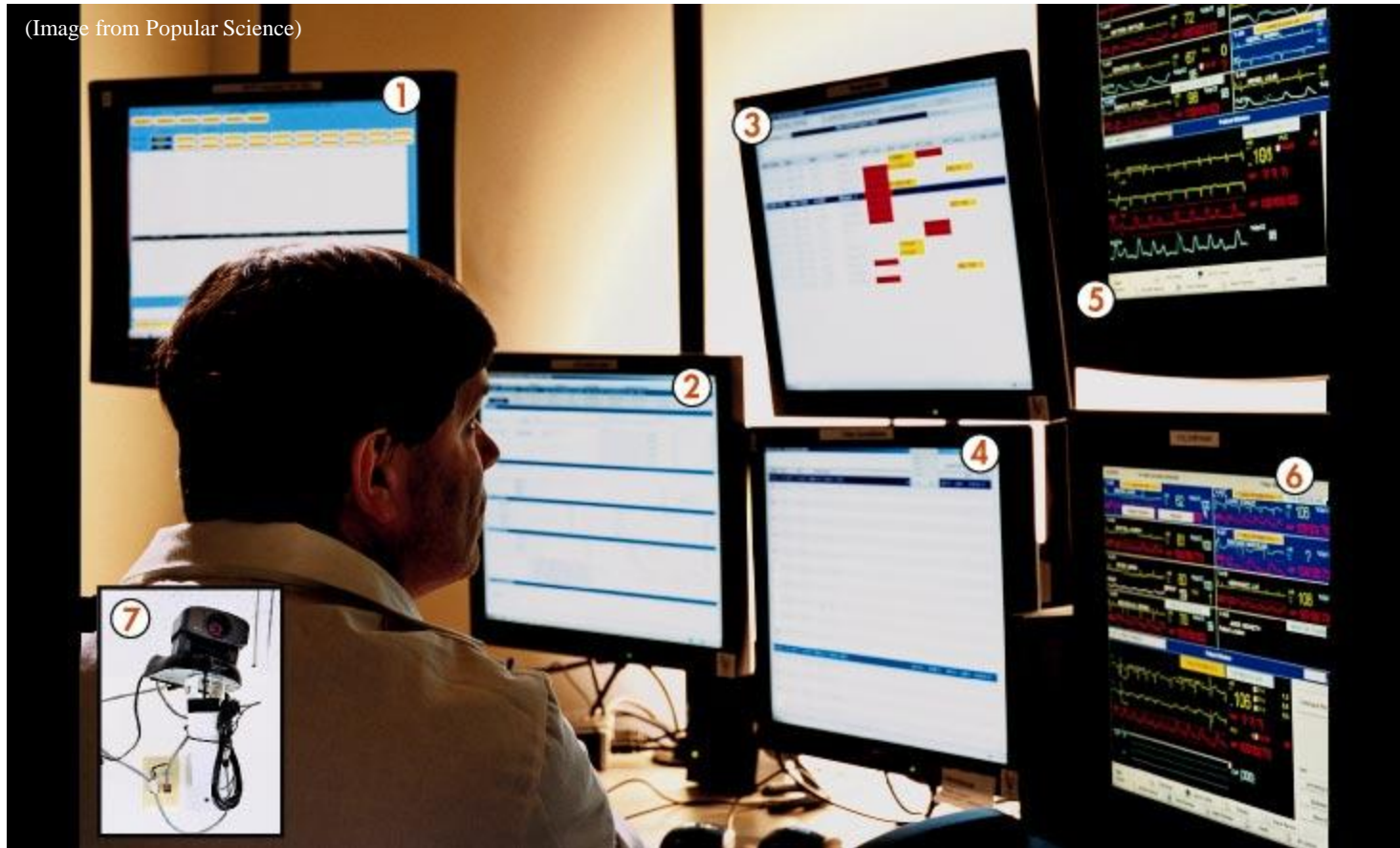
VICU

Virtual ICU Informational Pathways



VICU

(Image from Popular Science)



Inside the VICU

IPRO 372: Medical Informatics: Scoping Health Care Information Technology

Concepts & Methods

- What attributes make a good display?
 - Clinician's Opinions
 - Team's Opinions
- Good displays consist of:
 - Flexibility
 - Controllable
 - Scalable

Concepts & Methods

- Usability test
- Where did we get our information and results?
- How do we go about creating this display?

Concepts & Methods

```

LM12839          CSM ECS-CRYO TAB          0613
CTE 055:46:51 ( ) GWT 055:53:47 ( ) STTK
-----LIFE SUPPORT-----PRIMARY COOLANT-----
0F3571 LM CABIN P PSIA 34.4 CP0818 ACCUM QTY PCT 45.0
CF0001 CABIN P PSIA 5.1 CF0016 PUMP P PSID 45.0
CF0012 SUIT P PSIA 4.3 SF0260 RAD IN T F 73.8
CF0003 SUIT A P IN H2O -1.68
CF0015 COMP A P P PSID 0.30
CF0005 SURGE F P PSIA 891 CP0020 RAD OUT T F 35
SURGE QTY LBI 3.67 CP0181 EVAP IN T F 45.7
02 TR 1 CAP A P PSID 21 CF0017 STREAM T F 64.9
02 TR 1 CAP A P PSID 17 CF0034 STREAM P PSIA .161
CF0018 EVAP OUT T F 44.2

CF0036 02 MAN P PSIA 105
CF0035 02 FLOW LB/HR 0.181 SF0266 RAD VLV 1/2 ONR
CF0008 SUIT T P 50.5 CP0197 GLY FLO LB/HR 215
CF0002 CABIN P 65 -----SECONDARY COOLANT-----
CF0005 CO2 PP MMHG 1.5 CP0072 ACCUM QTY PCT 36.8
CF0009 WASTE PCT 24.4 CP0070 PUMP P PSID 9.3
WASTE LB 13.7 SF0262 RAD IN T F 76.5
CF0010 POTABLE PCT 104.5 SF0263 RAD OUT T F 44.6
POTABLE LB 37.6 CP0073 STREAM P PSIA .2460
CF0460 DRINE MDE T P 70 CP0071 EVAP OUT T F 66.1
CF0461 H2O MDE T F 72 CP0120 H2O-RES PSIA 25.8
TOTAL FC CDR AMPS
-----CRYO SUPPLY-----02-1-----02-2-----H2-1-----H2-2-----
SC0037-38-39-40 P PSIA 876.5 906 225.7(83-1) 235.1
SC0038-39-40 QTY PCT 77.63 0/S 73.24 74.83
SC0041-42-43-44-T F -189 -192 -417 -416
QTY LBS 251.1 260.0 20.61 20.83
    
```

April 13, 1969
12839

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Figure 6.4. Partial reconstruction of the computer display (display CSM ECS CRYO TAB) monitored by the electrical, environmental, and communication controller (EECOM) at 55:54:44 mission time during the Apollo 13 mission.

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LM12839          CSM ECS-CRYO TAB          0613
CTE 055:54:45 ( ) GWT 055:54:47 ( ) STTK
-----LIFE SUPPORT-----PRIMARY COOLANT-----
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CF0001 CABIN P PSIA 5.1 CF0016 PUMP P PSID 45.0
CF0012 SUIT P PSIA 4.1 SF0260 RAD IN T F 73.8
CF0003 SUIT A P IN H2O -1.68
CF0015 COMP A P P PSID 0.32
CF0006 SURGE F P PSIA 892 CP0020 RAD OUT T F 35
SURGE QTY LBI 3.68 CP0181 EVAP IN T F 45.7
02 TR 1 CAP A P PSID 20 CF0017 STREAM T F 64.9
02 TR 1 CAP A P PSID 15 CF0034 STREAM P PSIA .161
CF0018 EVAP OUT T F 44.2

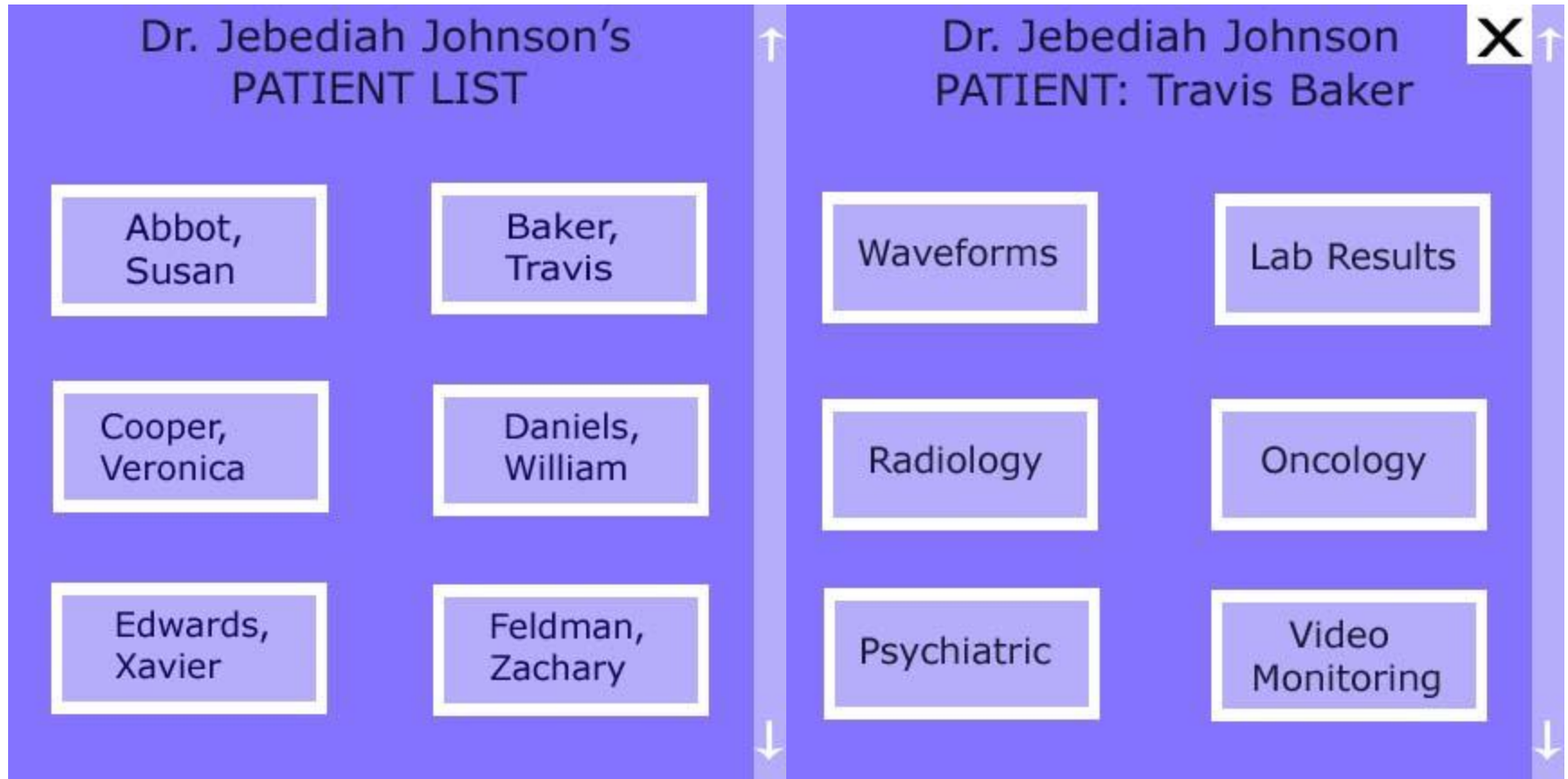
CF0036 02 MAN P PSIA 105
CF0035 02 FLOW LB/HR 0.163 SF0266 RAD VLV 1/2 ONR
CF0008 SUIT T P 50.2 CP0197 GLY FLO LB/HR 215
CF0002 CABIN P 65 -----SECONDARY COOLANT-----
CF0005 CO2 PP MMHG 1.5 CP0072 ACCUM QTY PCT 36.8
CF0009 WASTE PCT 24.2 CP0070 PUMP P PSID 9.3
WASTE LB 14.2 SF0262 RAD IN T F 76.5
CF0010 POTABLE PCT 104.5 SF0263 RAD OUT T F 44.6
POTABLE LB 37.6 CP0073 STREAM P PSIA .2460
CF0460 DRINE MDE T P 71 CP0071 EVAP OUT T F 66.1
CF0461 H2O MDE T F 72.1 CP0120 H2O-RES PSIA 25.8
TOTAL FC CDR AMPS
-----CRYO SUPPLY-----02-1-----02-2-----H2-1-----H2-2-----
SC0037-38-39-40 P PSIA 876.9 1008.3 225.7(83-1) 235.1
SC0038-39-40 QTY PCT 75.45 60 73.24 74.83
SC0041-42-43-44-T F -190 -160 -417 -416
QTY LBS 251.1 0/S 20.61 20.83
    
```

April 13, 1969
12839

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Figure 6.5. Partial reconstruction of the computer display (display CSM ECS CRYO TAB) monitored by the electrical, environmental, and communication controller (EECOM) at 55:54:45 mission time during the Apollo 13 mission. Note oxygen tank 2 pressure showed a peak at this point of 1,008 psi.

Concepts



Concepts

Dr. Jebediah Johnson
PATIENT: Travis Baker
LAB RESULTS

Culture Urine

Hematology Histology

Dr. Jebediah Johnson
PATIENT: Travis Baker
LAB RESULTS: Blood

| | |
|--------------------------|------------------|
| <i>Acidity</i> | <i>7.32</i> |
| Alcohol | 0.0 mg/dL |
| Ammonia | 20 µg of N/dL |
| Amylase | 65 units/L |
| Ascorbic Acid | 1.2 mg/dL |
| <i>Bicarbonate</i> | <i>15 mEq/L</i> |
| Bilirubin | Total: 1.0 mg/dL |
| Blood Volume | 9.0% |
| Calcium | 10.3mg/dL |
| CO ₂ pressure | 35 mm Hg |
| CD4 Cell Count | 1500 cells/µL |
| Ceruloplasmin | 55 mg/dL |
| Chloride | 103 mEq/L |

CBC

Conclusions

- What problem are we trying to solve?
- Areas of focus
 - Flexible ecological displays
 - Cognitive research
 - Information Science & Technology
 - ICU & VICU
- Methods to solve the problem:
 - Primary and secondary sources
 - Rapid prototyping
- Future work & research

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