

# Vycaria

## Virtual Cath Lab (Free Evaluation) User Guide

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## 1.0 Introduction

### 1.1 Virtual Cath Lab- High level overview

The VCL is a PC based computer simulation of a fluoroscopy suite with 2 main components: a) simulation of x-ray (fluoroscopy) equipment, and b) simulation of the clinical radiology procedure (currently in development).

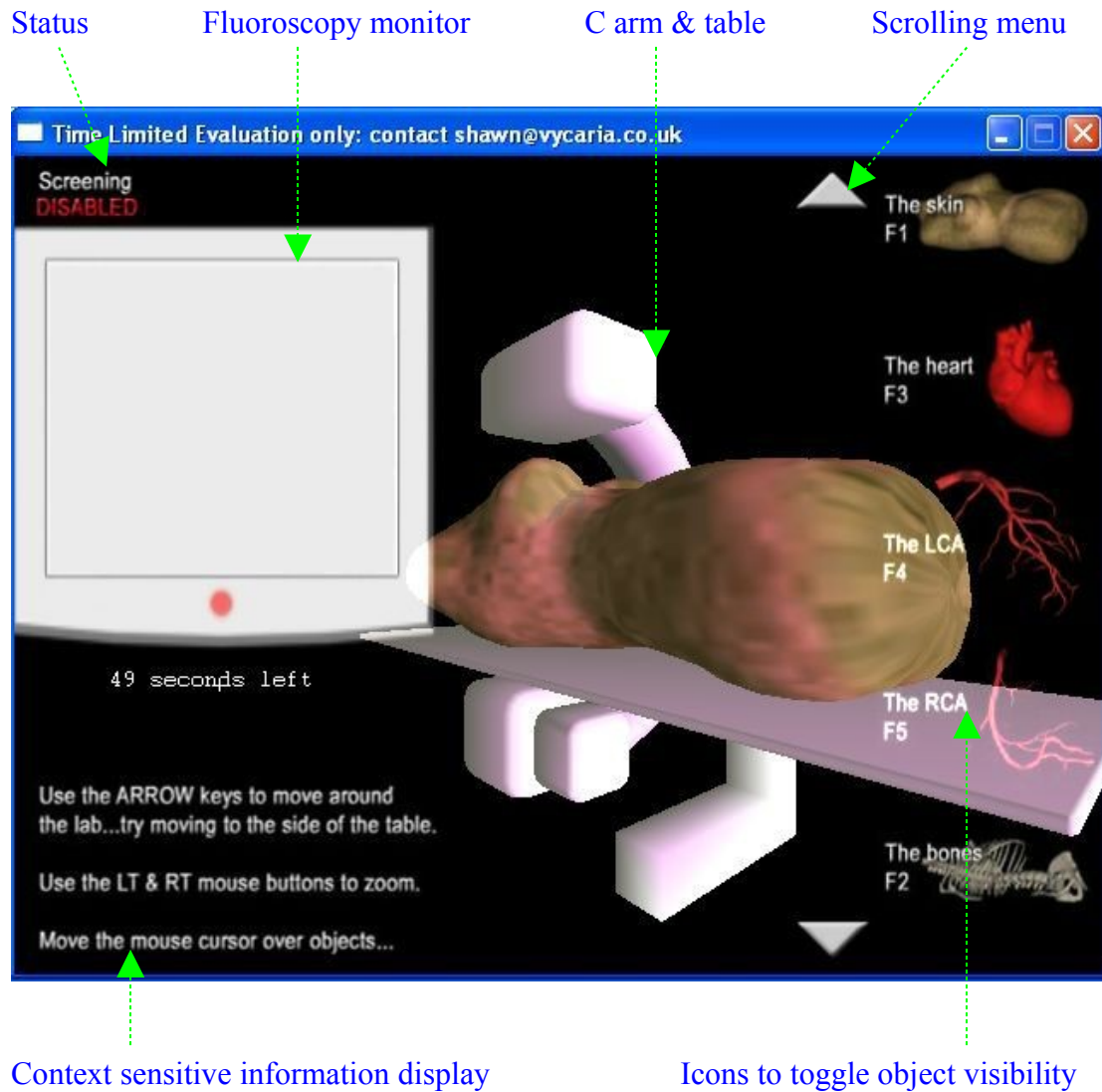
The VCL is based on 3D games technology and utilises an interactive real time '3D rendering' engine which will run on any Windows PC. Simulation of the fluoroscopy equipment (using a PC with a mouse or laptop track pad / optional game joysticks to simulate equipment movement) within the game engine is entirely consistent with the way the equipment operates in the real world, so provides a completely 'safe' (to both staff and the patient) radiation-free training environment.

In practise, users will run the software either in hospital or at home to achieve learning outcomes (improvement in hand / eye co-ordination and / or increased knowledge of 3D anatomy). Users can be assessed by a mentor, however a feedback mechanism with user certification against customisable pre-defined outcome criteria has been identified as a product requirement for a future release.

The VCL will run on any PC / laptop, enabling users the flexibility to train at a time and location of their convenience. The software is deployed as a single, small (about 2Mb) executable file & requires no additional software infrastructure (e.g. Java, ActiveX, etc) to be deployed other than that found in 'standard' Windows PCs.

## 2.0 Starting up...

This is what you should see when you first begin



The application has 2 interactive modes:

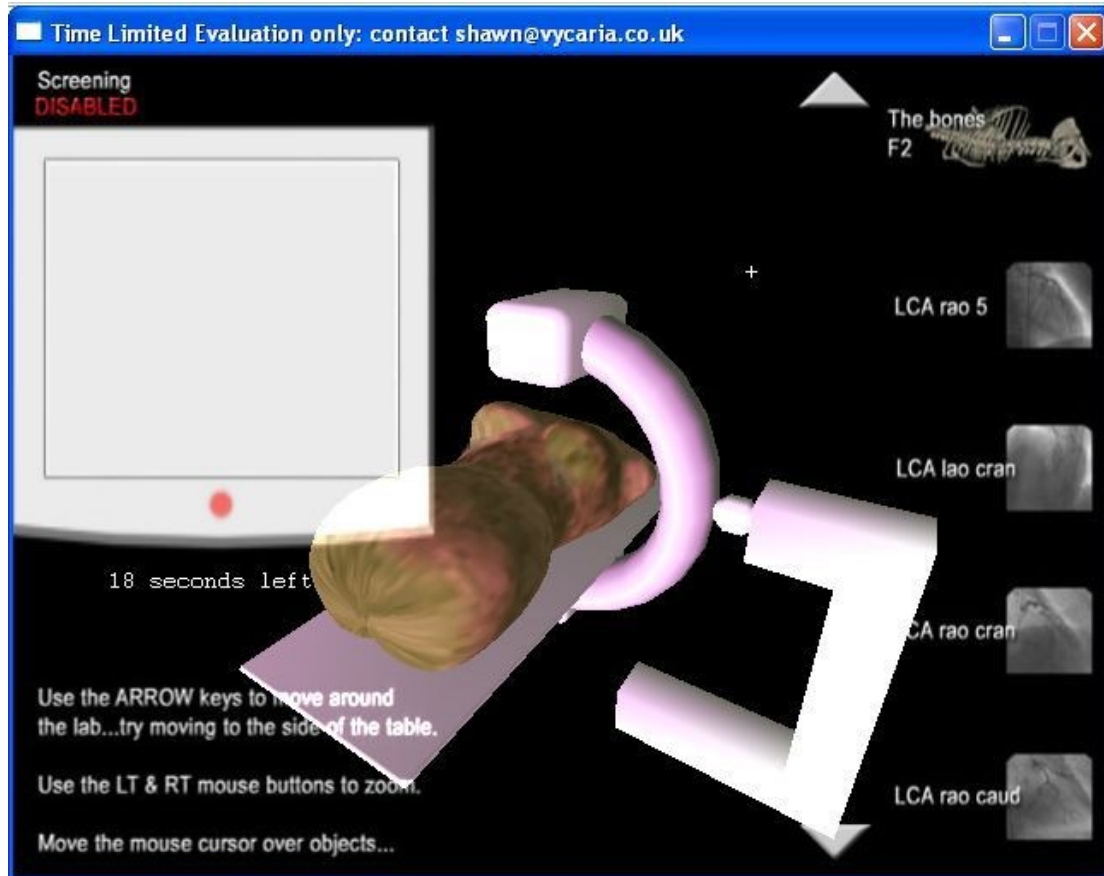
- Screening **Disabled**
- Screening **Enabled**

You can toggle between them using the **Spacebar**.

When screening is enabled, press **ENTER** to activate screening...

### 3.0 Screening Disabled

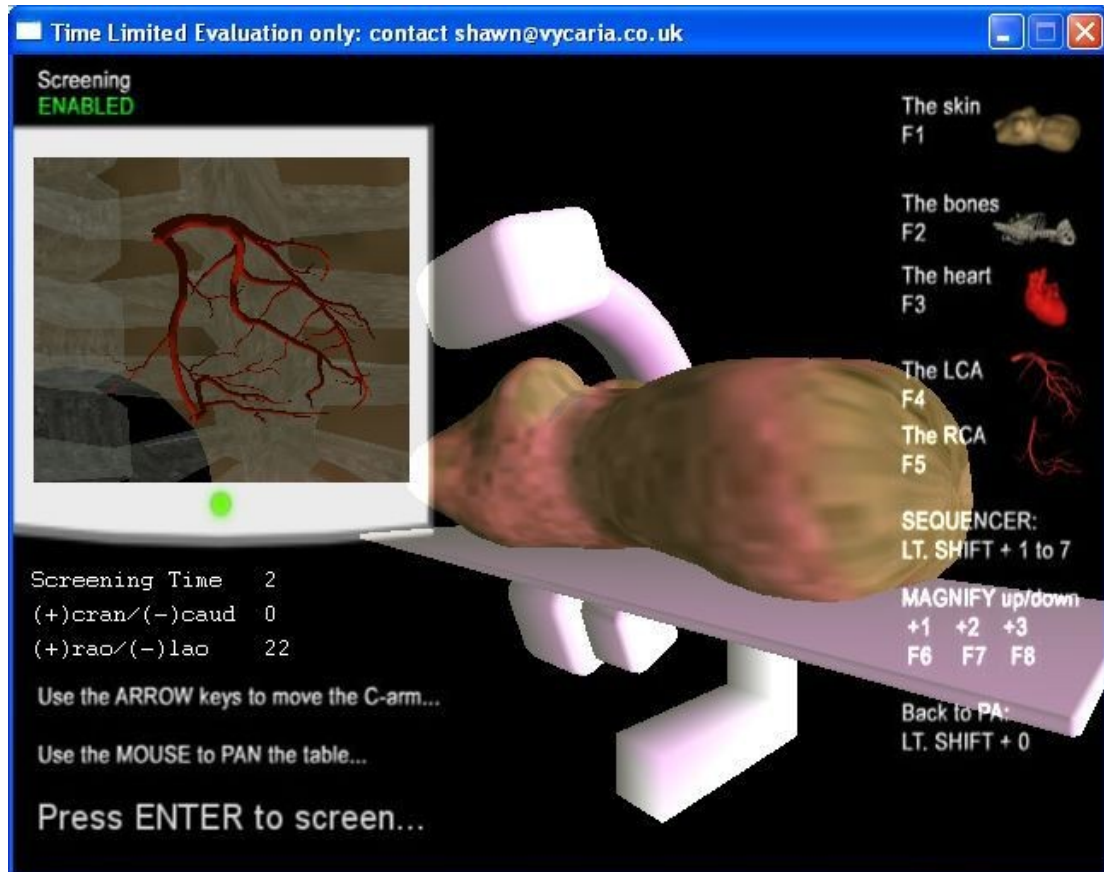
When screening is **disabled**, use the **left, right, up & down arrow keys** to **move around the lab**



- Use the mouse to move the **cursor over objects** in the scene- the **context sensitive information display** will tell you more about the selected object.
- Moving the **cursor** over the **standard views thumbnails** will engage the **auto-sequencer**.
- Use the **left and right mouse buttons** to **zoom in and out** of the scene.
- To toggle the **visibility of anatomy**, use the corresponding **function keys**.

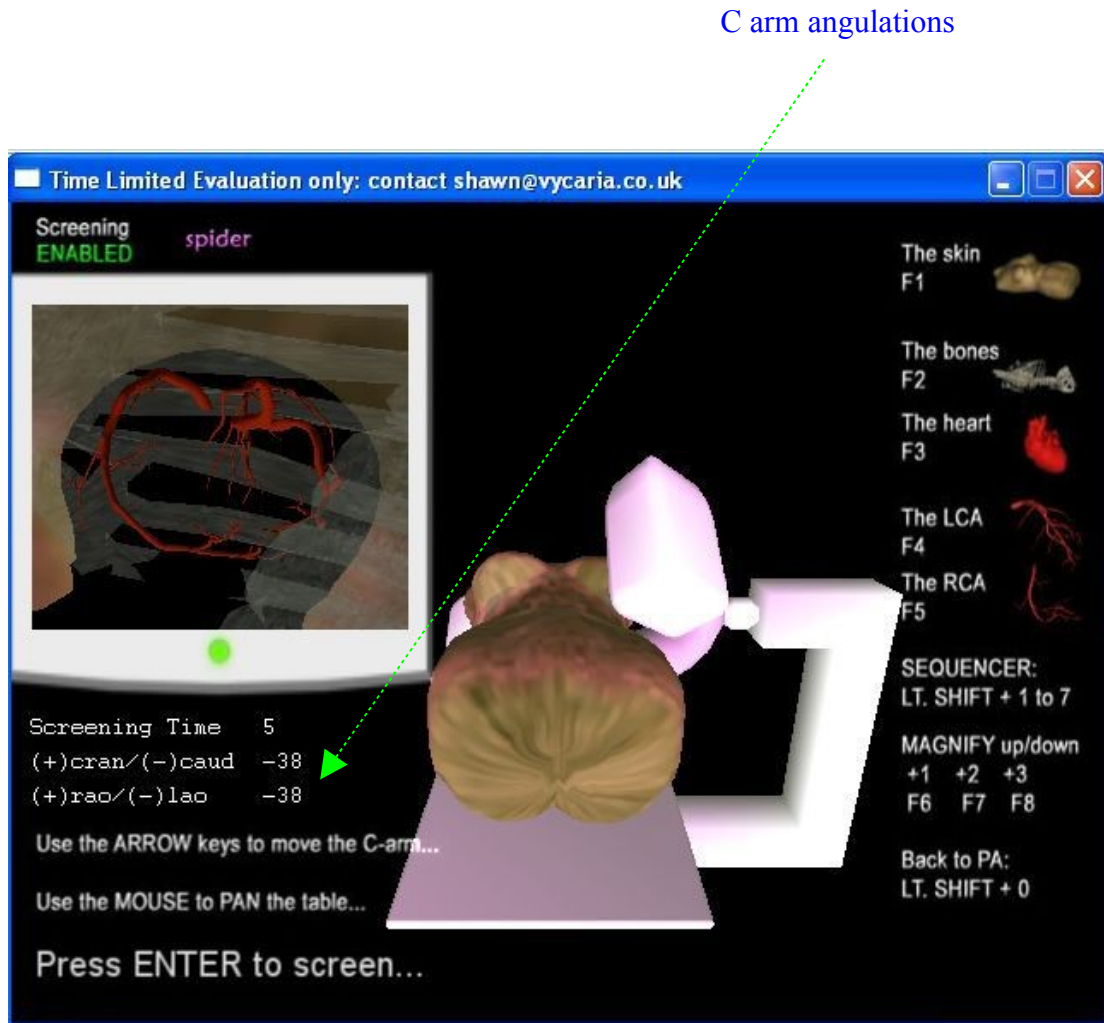
## 4.0 Screening Enabled

Press the **spacebar** to **enable screening**- you can now move the table and C arm.



- Press & hold the **ENTER** button to screen!
- The **mouse** now controls the **floating top table**.
- The **Left and Right mouse buttons** control **table height**.
- The **Left, Right, Up and Down keys** control the **c-arm**.
- Visibility of the **anatomical models** can now be toggled using the **function keys**.
- The **intensifier magnification** factor can be changed using the **function keys**.

## 5.0 Screening Enabled



This is a typical working position for a technician driving the table and c-arm. From this position, try moving your mouse...

- **Mouse movements** now correspond to real world **table movement**, i.e. moving the **mouse forward** will move the **table forward**- the image displayed on the monitor moves realistically as well.
- Keys **E** and **D** move the **c-arm north** and **south**
- Keys **R** and **F** move the **II head up** and **down**



## 6.0 Screening Disabled

Try zooming right in to the coronary arteries (use the **left mouse button** to **zoom in** and the **right mouse button** to **zoom out** when screening is disabled).

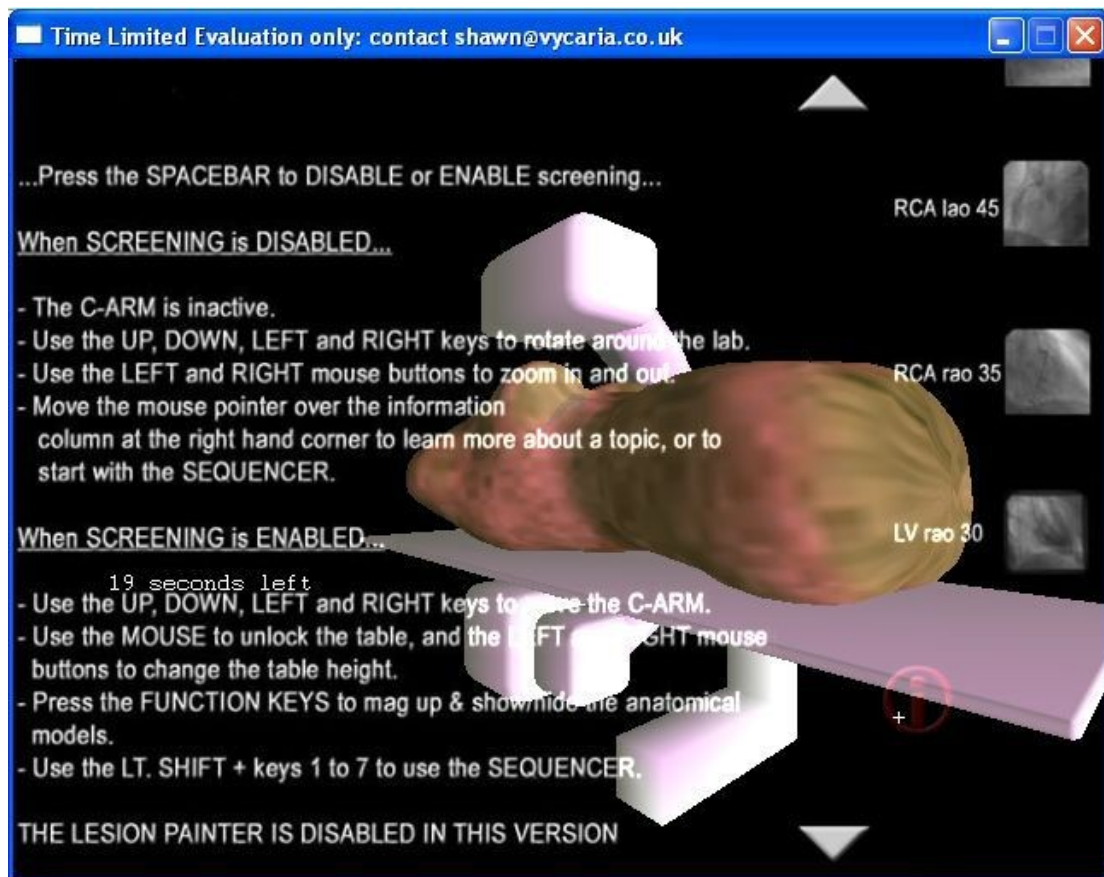


Moving the mouse cursor over anatomical structure will identify and highlight more detail regarding the structure in the context sensitive information display panel.



## 7.0 Screening Disabled

This is a screenshot of the **on line help** information.



## 8.0 Additional Features

The VCL is being developed using an interactive real-time 3D rendering (game) engine. The environment this engine is able to generate combines the accuracy and realism of 'real world' fluoroscopy with a touch of imagination, enabling 'virtual' fluoroscopy.

### 8.1 Real world Fluoroscopy

The VCL attempts to replicate the functionality of a real fluoroscopy suite as realistically as possible and has many features found on a real c-arm including magnification, II head movement, c-arm gantry control and a sequencer.

#### 8.11 Magnification



When screening is enabled use the Function keys (F6, F7 & F8) to mag up & down.

#### 8.12 II Head Movement

When screening is enabled use the 'R' and 'F' keys to raise and lower the II head.

#### 8.13 C-Arm Gantry Control

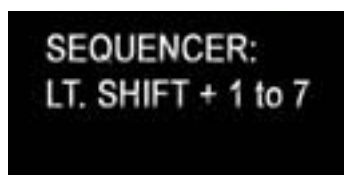
When screening is enabled use the 'E' and 'F' keys to run the c-arm north and south.

#### 8.14 Sequencer



When screening is disabled, use the scrolling menu to navigate to the above icons & then move the mouse cursor over them to move the c-arm to that particular position.

This will also automatically demonstrate the appropriate anatomy ie. Selecting LCA Lao Cran will remove the RCA and move the c-arm position to LAO 50, Cran 30.



When screening is enabled use the number keys '1' to '7' plus the 'Left Shift' key to activate the sequencer:

- Lt Shift + 1 - RAO 5
- Lt Shift + 2 - LAO Cranial
- Lt Shift + 3 - RAO Cranial
- Lt Shift + 4 - RAO Caudal
- Lt Shift + 5 - LAO straight
- Lt Shift + 6 - RAO Straight
- Lt Shift + 7 - RAO 30 (LV)

## 8.2 Virtual Fluoroscopy

The VCL attempts to replicate the functionality of a real fluoroscopy suite as realistically as possible whilst at the same indulging in a little reality suspension with features which include visibility toggling and context sensitive information display.

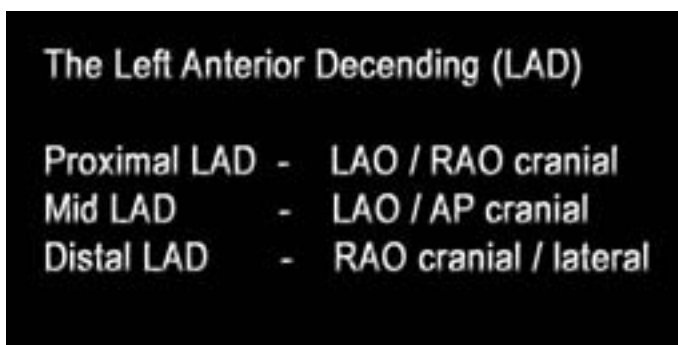
### 8.21 Visibility Toggling



When in screening disabled or enabled mode, use the function keys to toggle anatomical organ visibility.

- F1 – ‘skin’
- F2 – ‘bones’
- F3 – ‘heart’
- F4 – ‘LCA’
- F5 – ‘RCA’

### 8.22 Context sensitive information display



When in screening disabled mode moving the mouse cursor over certain objects will display more information about that particular object.

**Further information:**

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