DIGITAL TEMPLATING IN THR

Do scaling markers improve accuracy?

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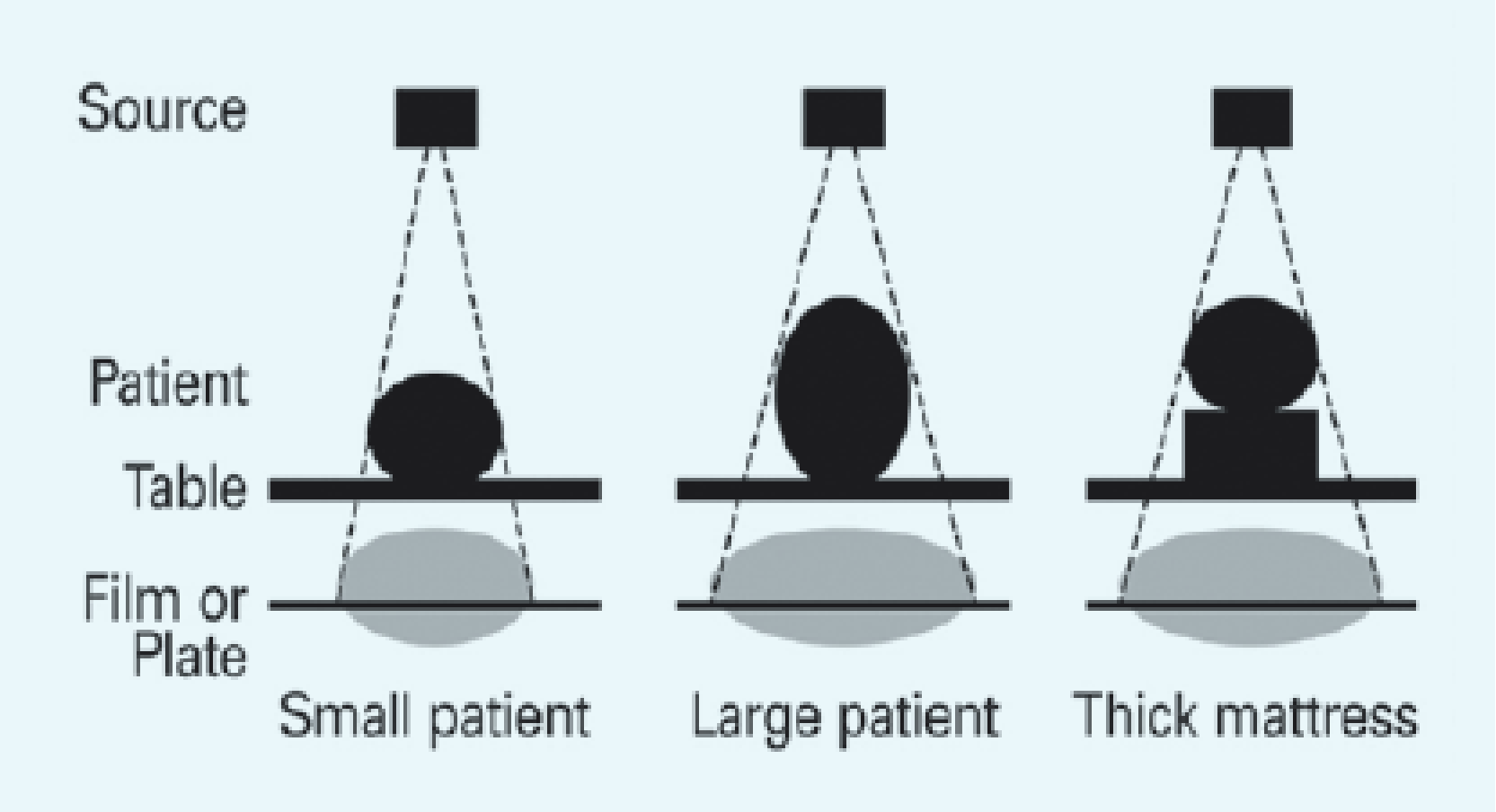
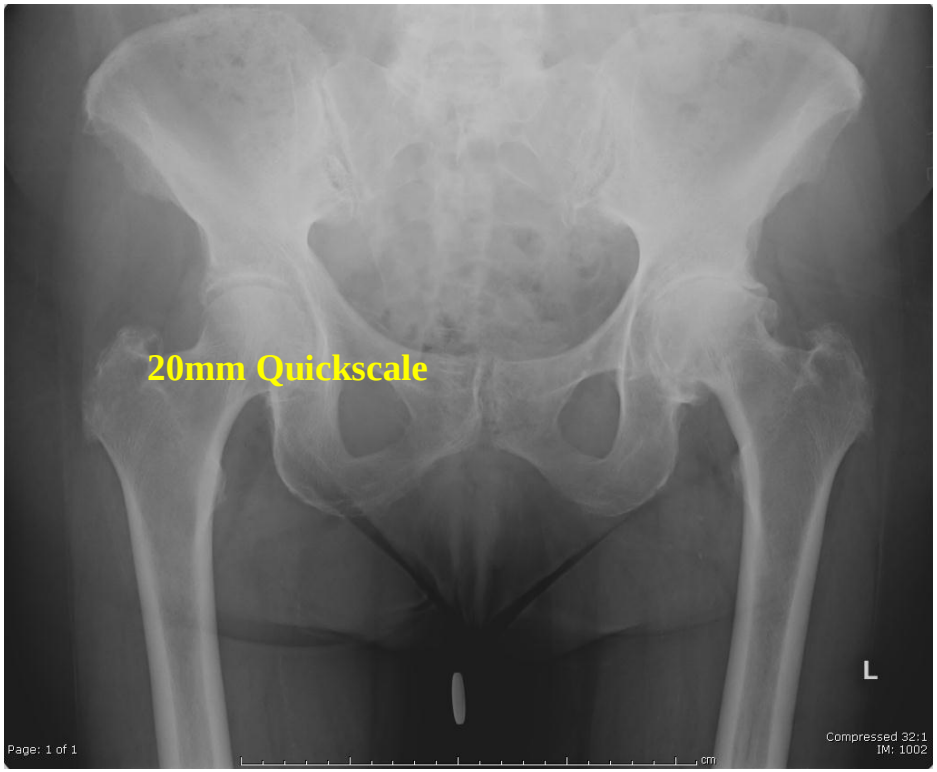
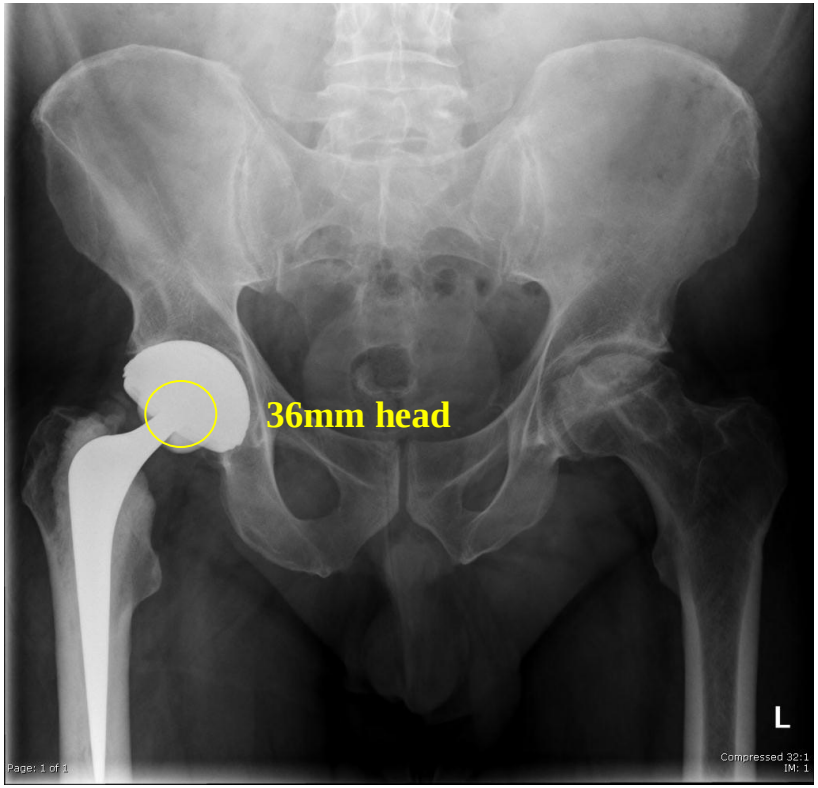
Barwon Orthopaedic Research Unit
Geelong Hospital, Victoria

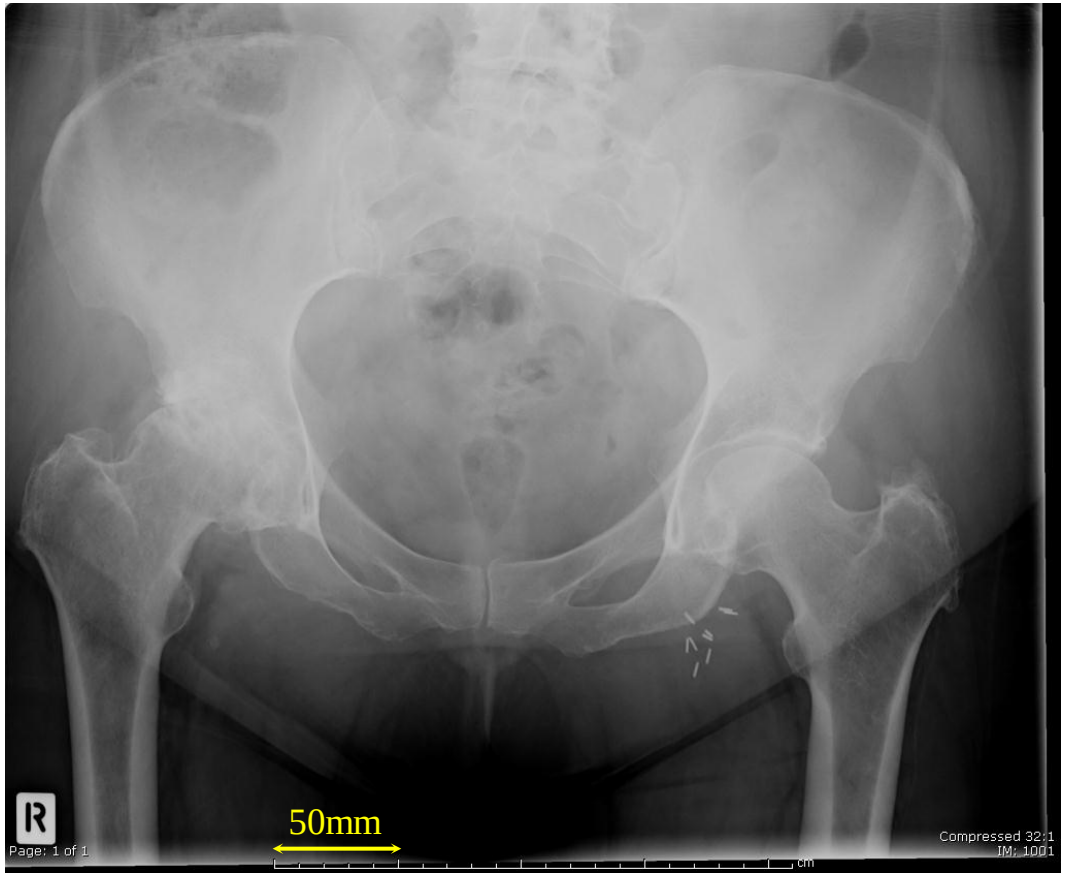


Magnification is dependant on how far the object being imaged is from the Xray plate


20mm Quickscale
L
Page: 1 of 1
cm
Compressed 32:1
IM: 1002


36mm head
L
Page: 1 of 1
Compressed 32:1
IM: 1

- No scaling marker available?
- “Ruler method”
  - At the level of the plate, not the patient



- OrthoView™ is used at Barwon Health
  - Allows digital image of pelvis to be imported from PACS
  - Scaling of image performed
  - Appropriately scaled template used
  - Library of prostheses from different companies

OrthoView™
Orthopaedic Digital Templating

Disclosure: No outside funding or grants were recevied from OrthoView, Meridian Technique LTD, UK for this research or preparation of this work

Aims

- Does the use of a scaling marker improve accuracy of digital templating in THR

Methodology

- PACS online at Barwon Health from July 2007
- Inclusion criteria:
  - All primary THR done since introduction of PACS
  - Must have digital pre op Xrays
  - Prosthesis must be in the OrthoView template library
- 114 Cases
  - 62 Without scaling marker (54%)
  - 52 With scaling marker (46%)

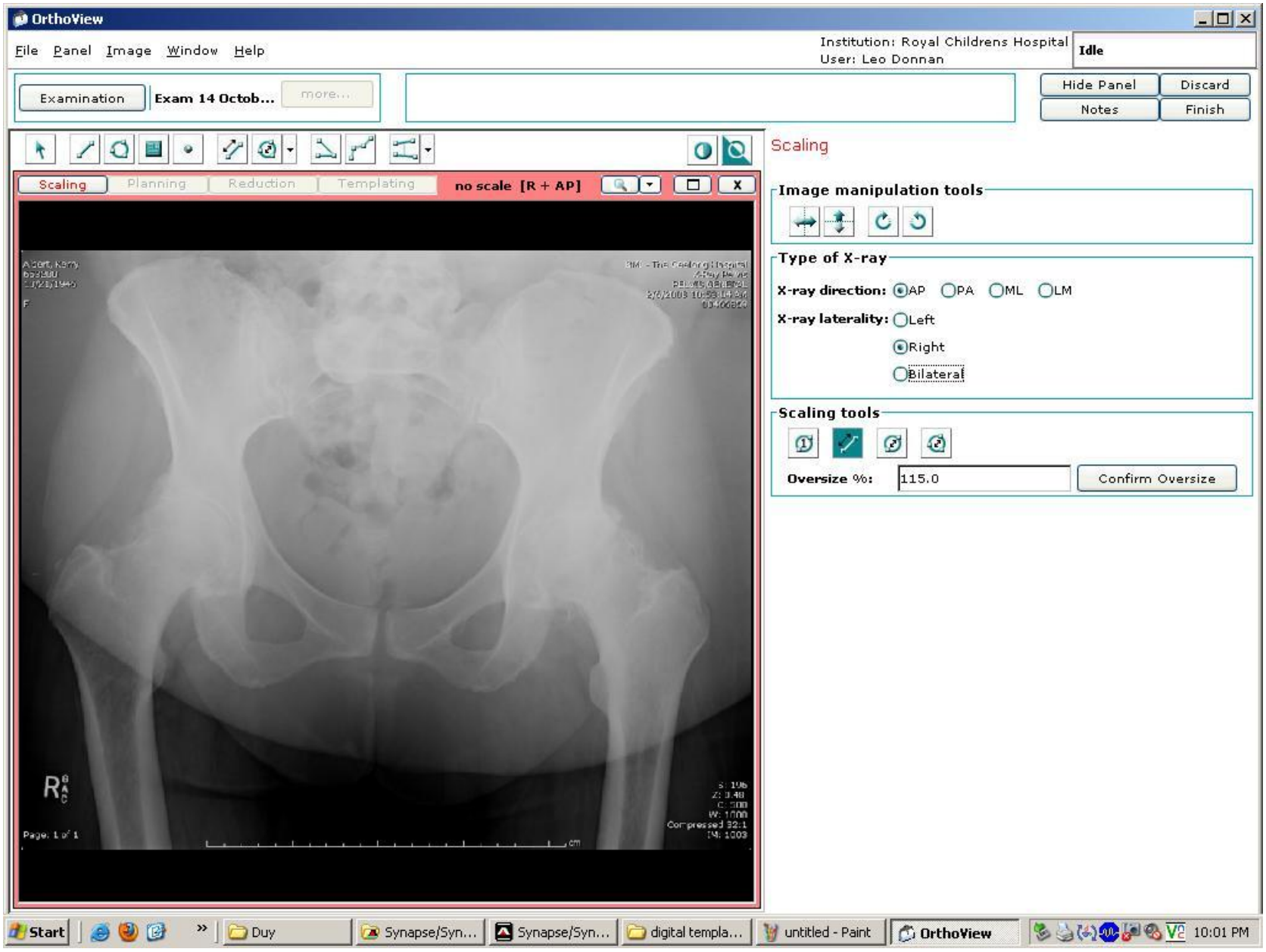
Methodology

- Size difference between actual prosthesis implanted and templated prosthesis recorded

Acetabular Size

Femoral Size

Femoral Offset


OrthoView
File Panel Image Window Help
Institution: Royal Childrens Hospital
User: Leo Donnan
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Examination
Exam 14 Octob...
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Hide Panel
Discard
Notes
Finish
Scaling
Planning
Reduction
Templating
no scale [R + AP]
Scaling
Image manipulation tools
Type of X-ray
X-ray direction: AP PA ML LM
X-ray laterality: Left
Right
Bilateral
Scaling tools
Oversize %: 115.0
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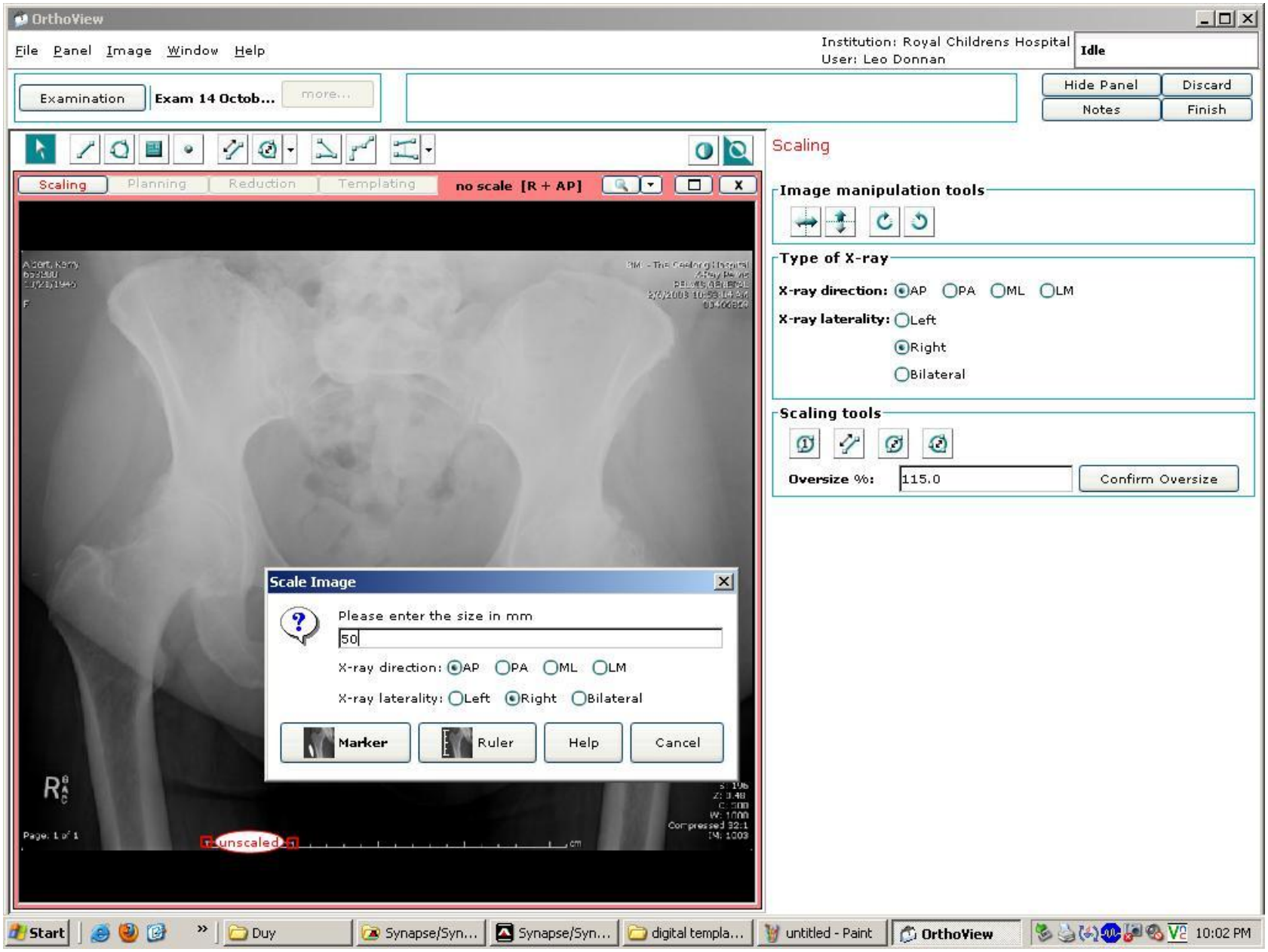
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Scaling
Image manipulation tools
Type of X-ray
X-ray direction: AP PA ML LM
X-ray laterality: Left Right Bilateral
Scaling tools
Oversize %: 115.0
Confirm Oversize
Scale Image
Please enter the size in mm
50
X-ray direction: AP PA ML LM
X-ray laterality: Left Right Bilateral
Marker
Ruler
Help
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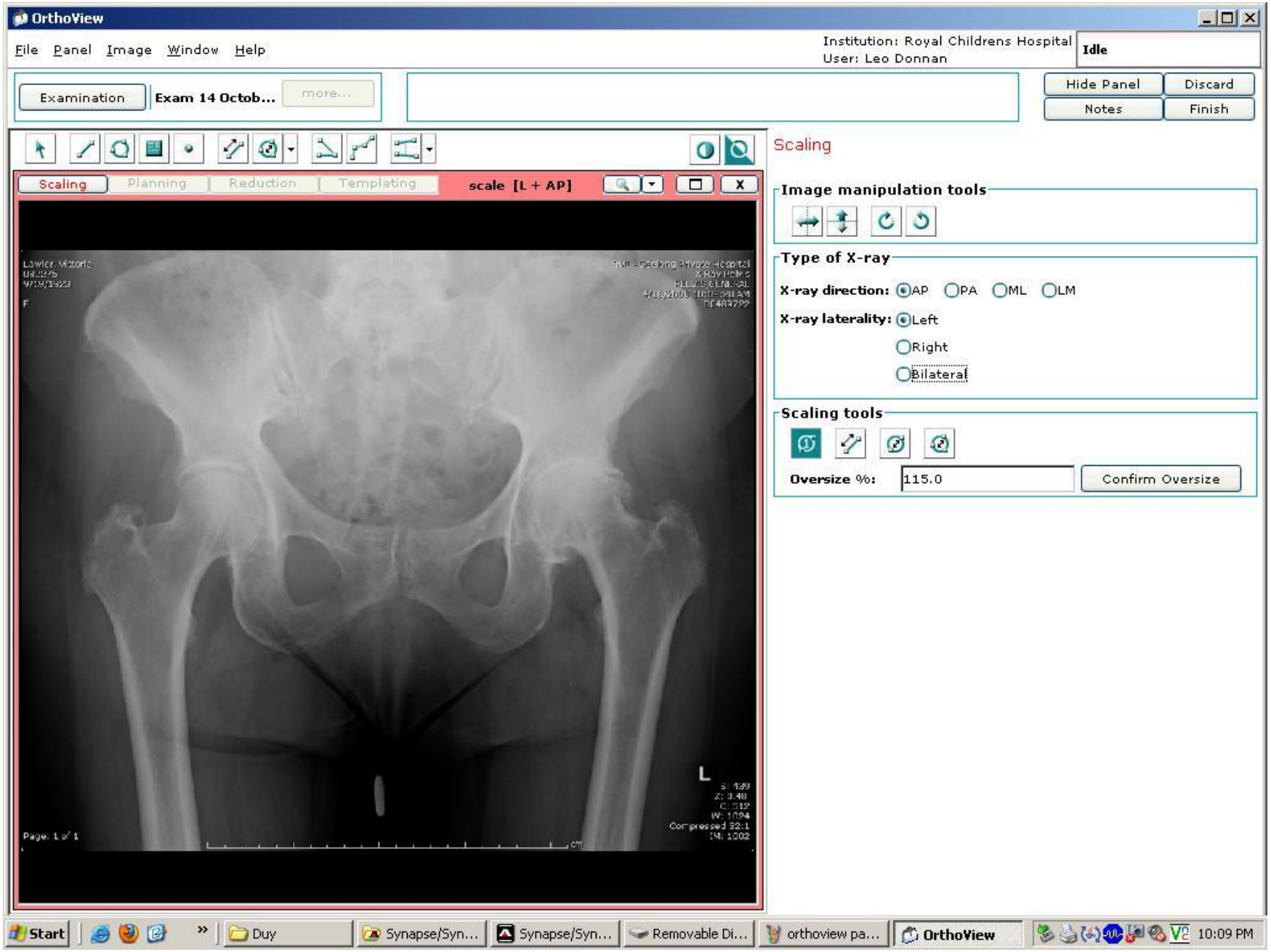
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X-ray laterality: Left
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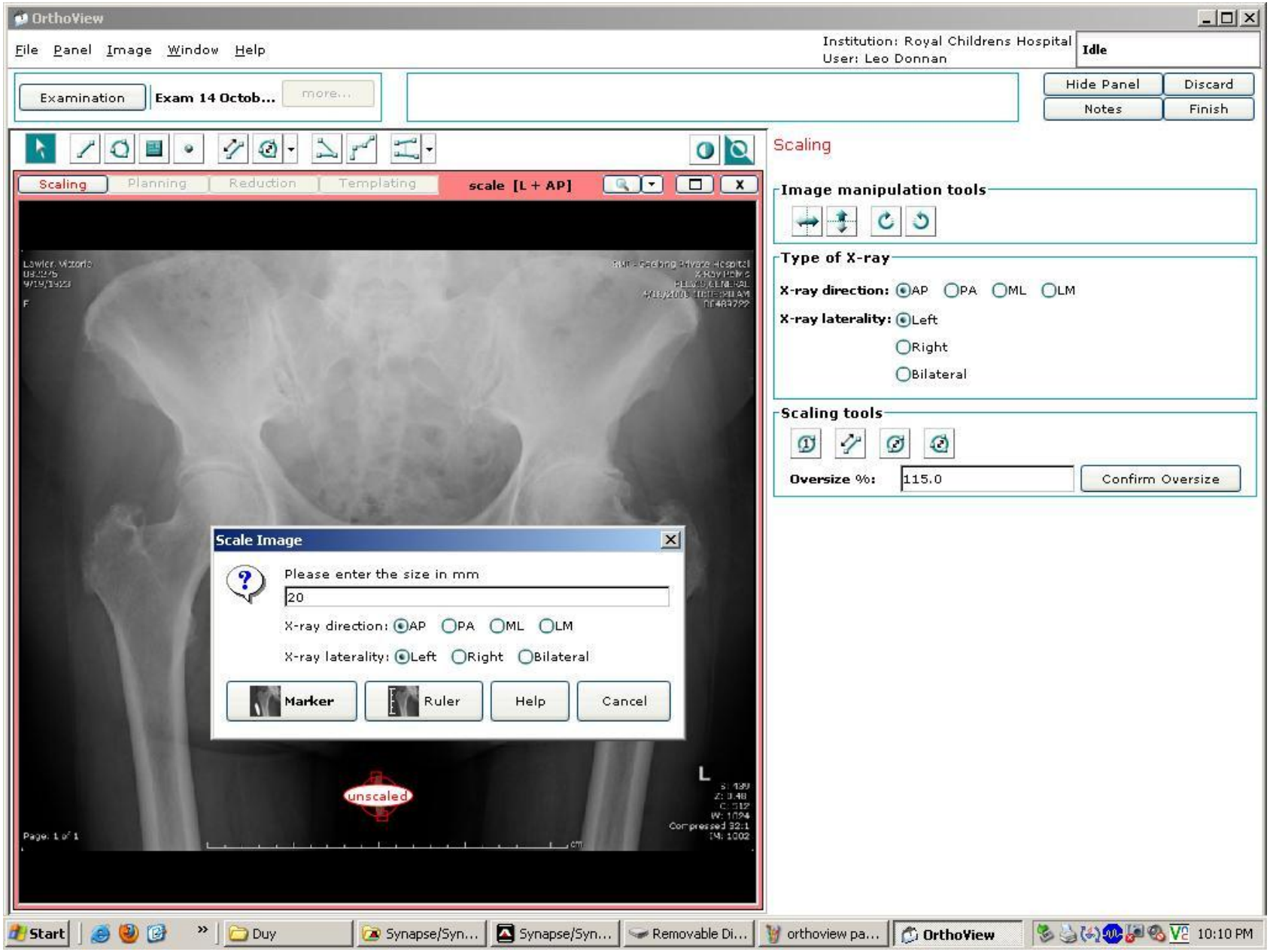
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X-ray laterality: Left Right Bilateral
Scaling tools
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Scale Image
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20
X-ray direction: AP PA ML LM
X-ray laterality: Left Right Bilateral
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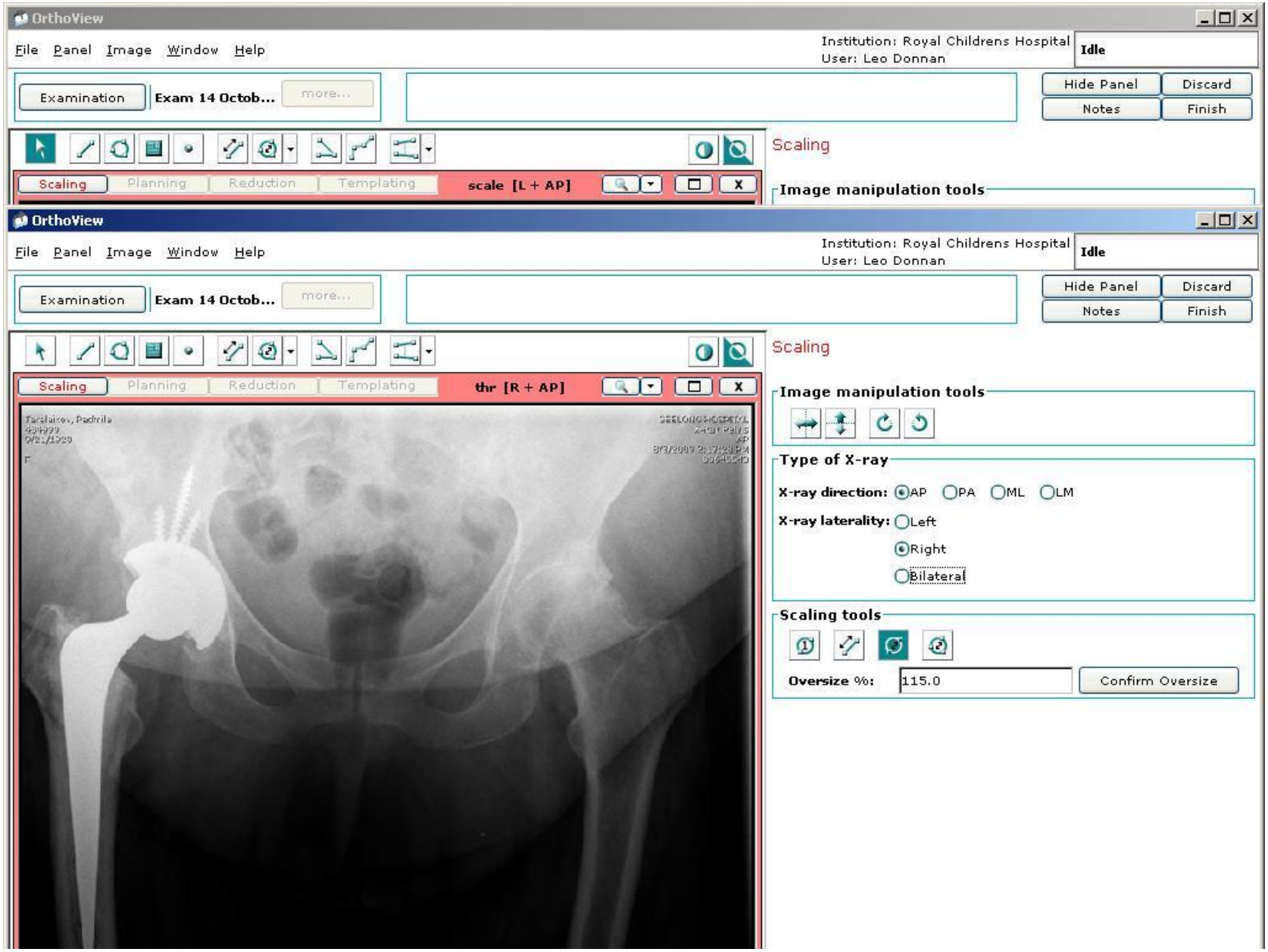
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X-ray direction: AP PA ML LM
X-ray laterality: Left
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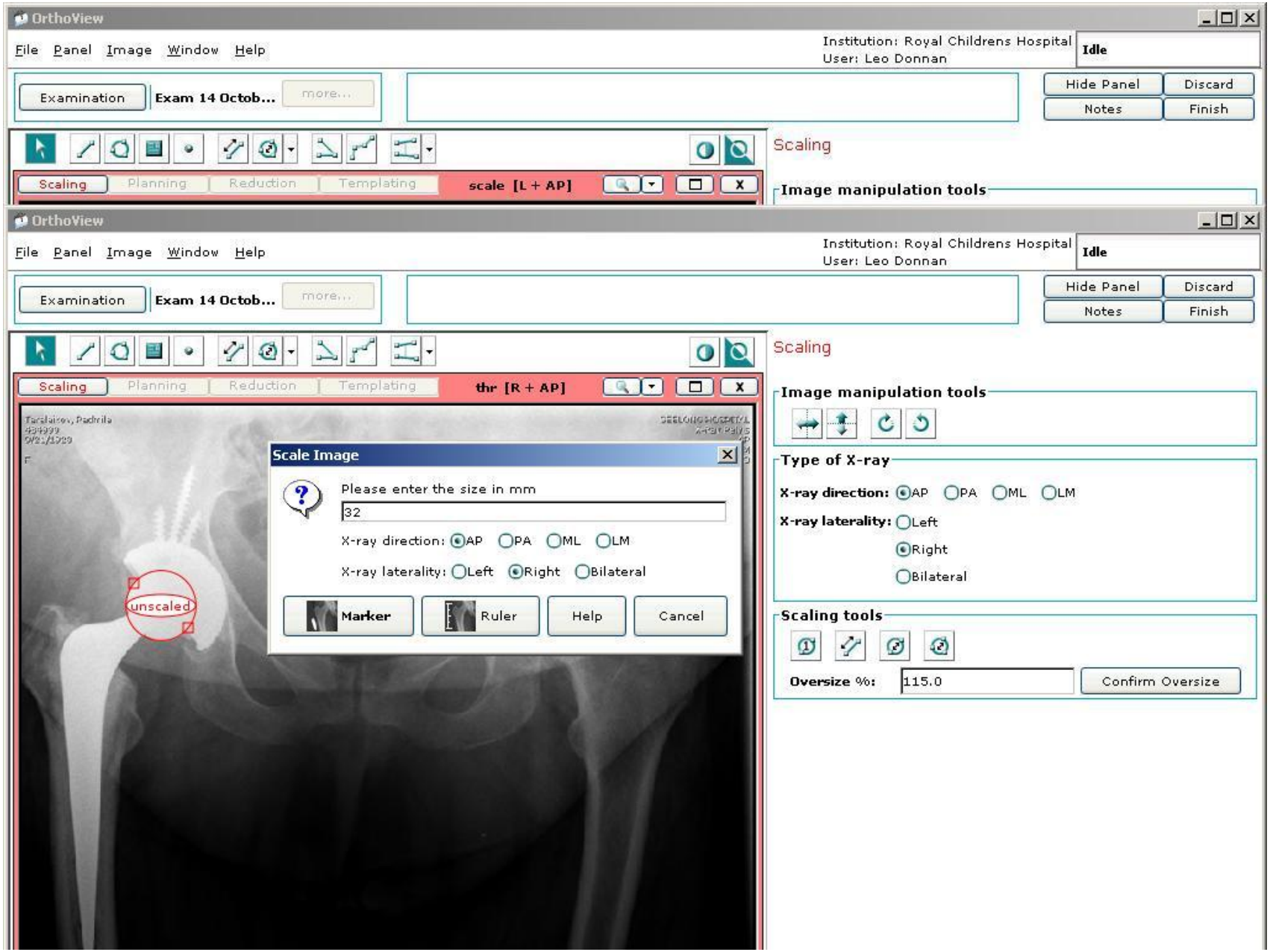
Bilateral
Scaling tools
Oversize %: 115.0
Confirm Oversize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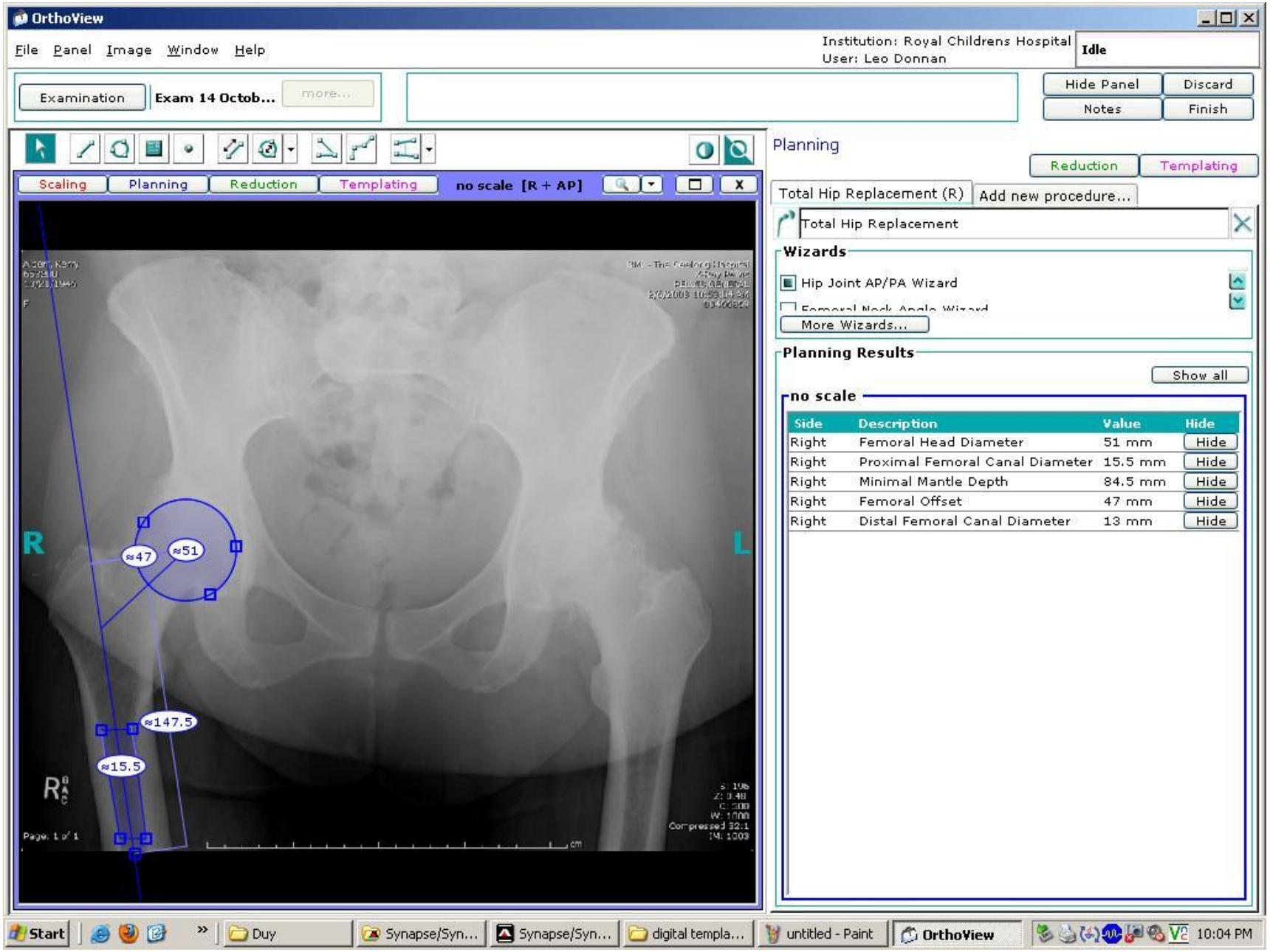
Scaling
Image manipulation tools
Type of X-ray
X-ray direction: AP PA ML LM
X-ray laterality: Left Right Bilateral
Scaling tools
Oversize %: 115.0
Confirm Oversize
Scale Image
Please enter the size in mm
32
X-ray direction: AP PA ML LM
X-ray laterality: Left Right Bilateral
Marker
Ruler
Help
Cancel
unscaled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User: Leo Donnan
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Exam 14 Octob...
more...
Hide Panel
Discard
Notes
Finish
Scaling
Planning
Reduction
Templating
no scale [R + AP]
Planning
Reduction
Templating
Total Hip Replacement (R)
Add new procedure...
Total Hip Replacement
Wizards
Hip Joint AP/PA Wizard
More Wizards...
Planning Results
Show all
no scale
Side
Description
Value
Hide
Right
Femoral Head Diameter
51 mm
Hide
Right
Proximal Femoral Canal Diameter
15.5 mm
Hide
Right
Minimal Mantle Depth
84.5 mm
Hide
Right
Femoral Offset
47 mm
Hide
Right
Distal Femoral Canal Diameter
13 mm
Hide
R
L
≈47
≈51
≈147.5
≈15.5
Start
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Synapse/Syn...
digital templa...
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OrthoView
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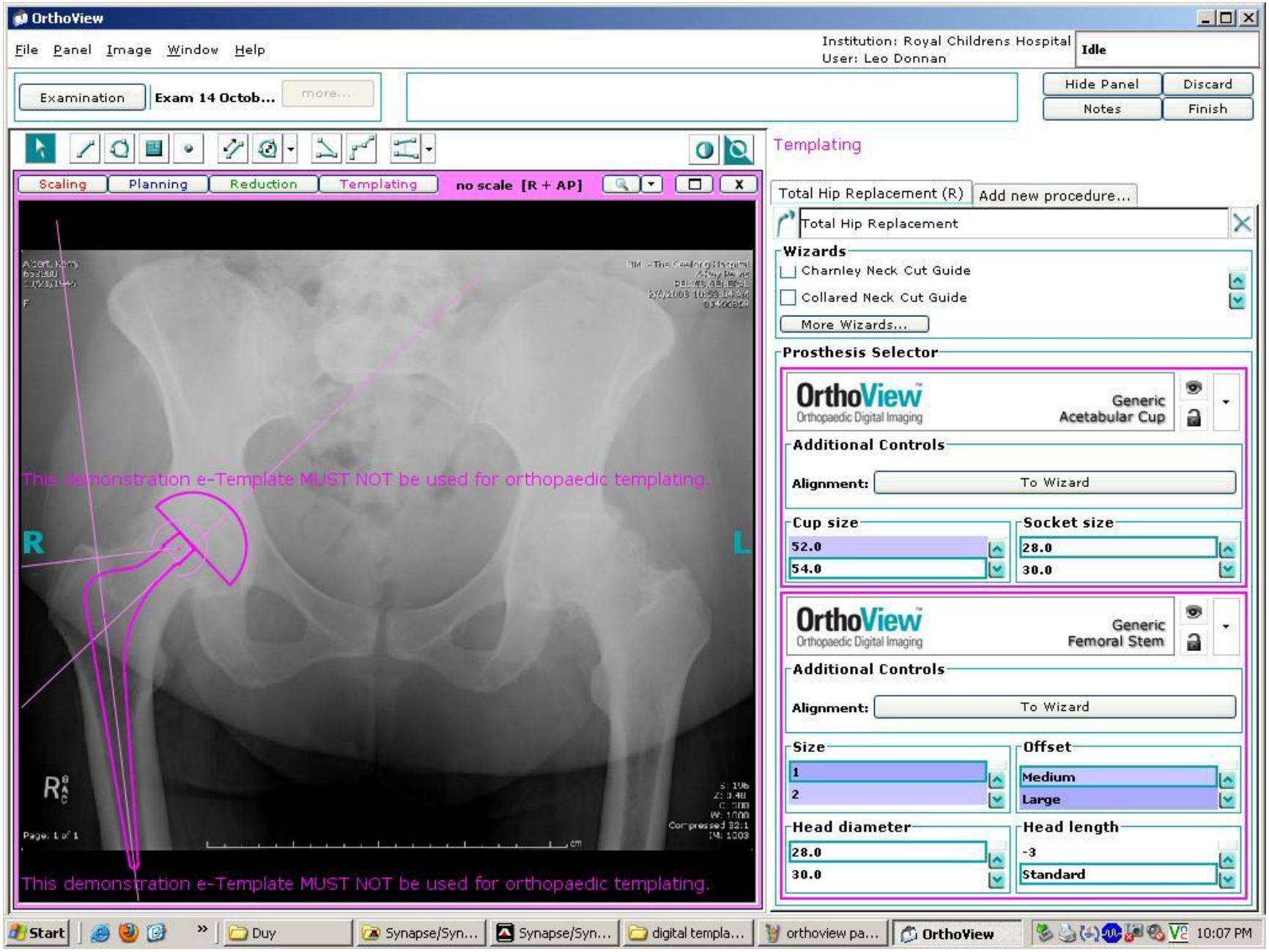
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Institution: Royal Childrens Hospital
User: Leo Donnan
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Examination
Exam 14 Octob...
more...
Hide Panel
Discard
Notes
Finish
Scaling
Planning
Reduction
Templating
no scale [R + AP]
This demonstration e-Template MUST NOT be used for orthopaedic templating.
R
L
This demonstration e-Template MUST NOT be used for orthopaedic templating.
Templating
Total Hip Replacement (R)
Add new procedure...
Total Hip Replacement
Wizards
Charnley Neck Cut Guide
Collared Neck Cut Guide
More Wizards...
Prosthesis Selector
OrthoView
Orthopaedic Digital Imaging
Generic
Acetabular Cup
Additional Controls
Alignment:
To Wizard
Cup size
52.0
54.0
Socket size
28.0
30.0
OrthoView
Orthopaedic Digital Imaging
Generic
Femoral Stem
Additional Controls
Alignment:
To Wizard
Size
1
2
Offset
Medium
Large
Head diameter
28.0
30.0
Head length
-3
Standard
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Synapse/Syn...
digital templa...
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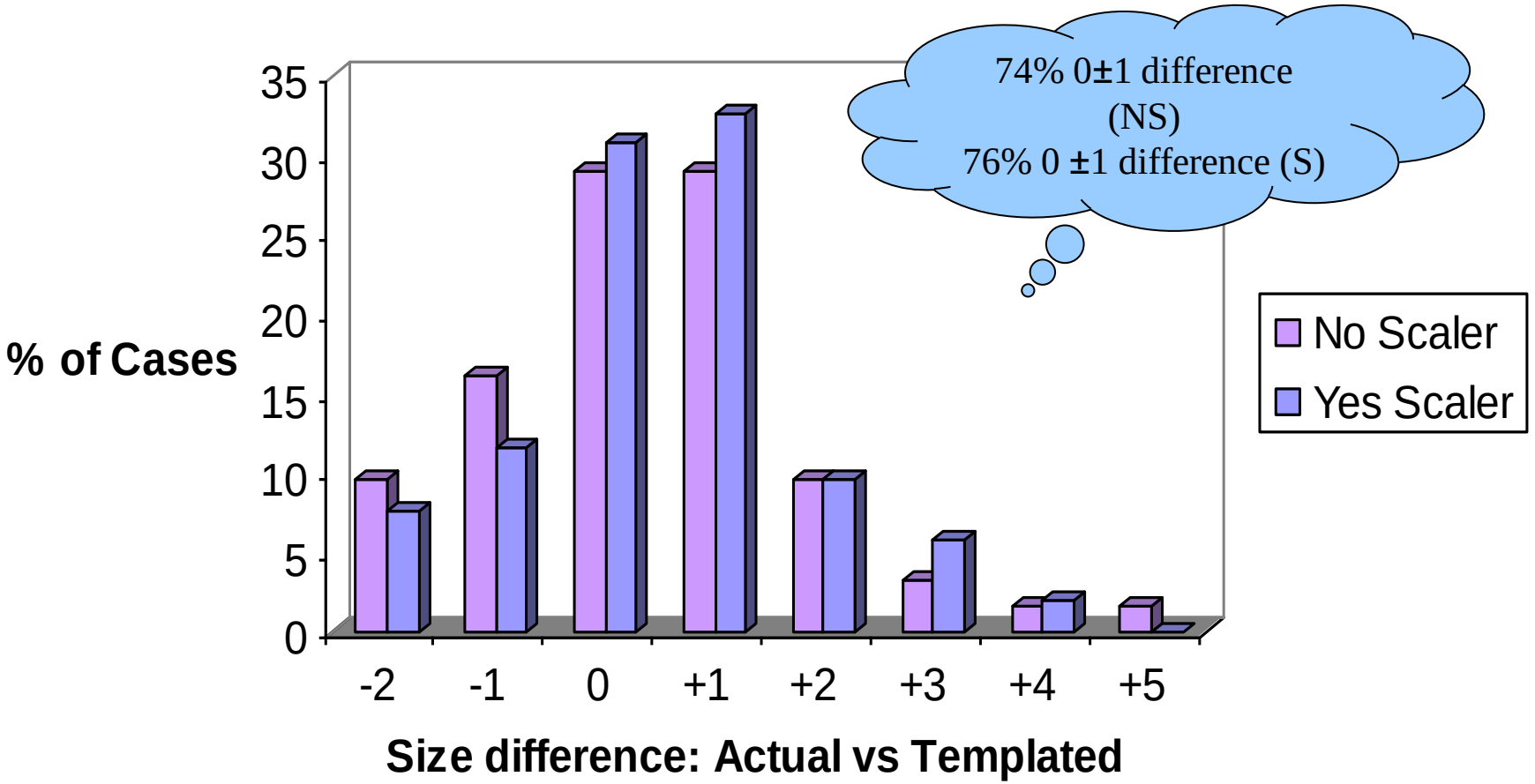
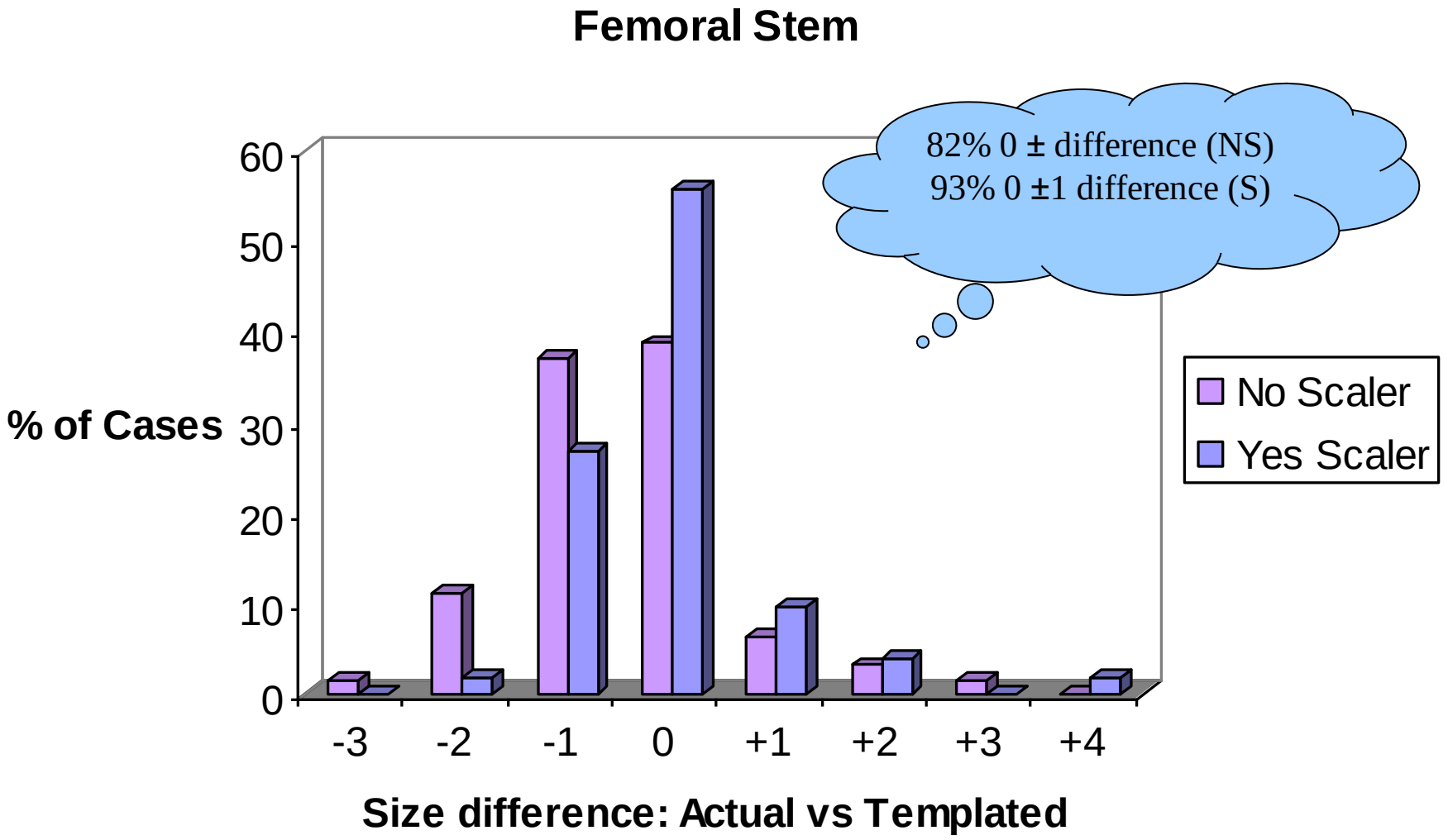
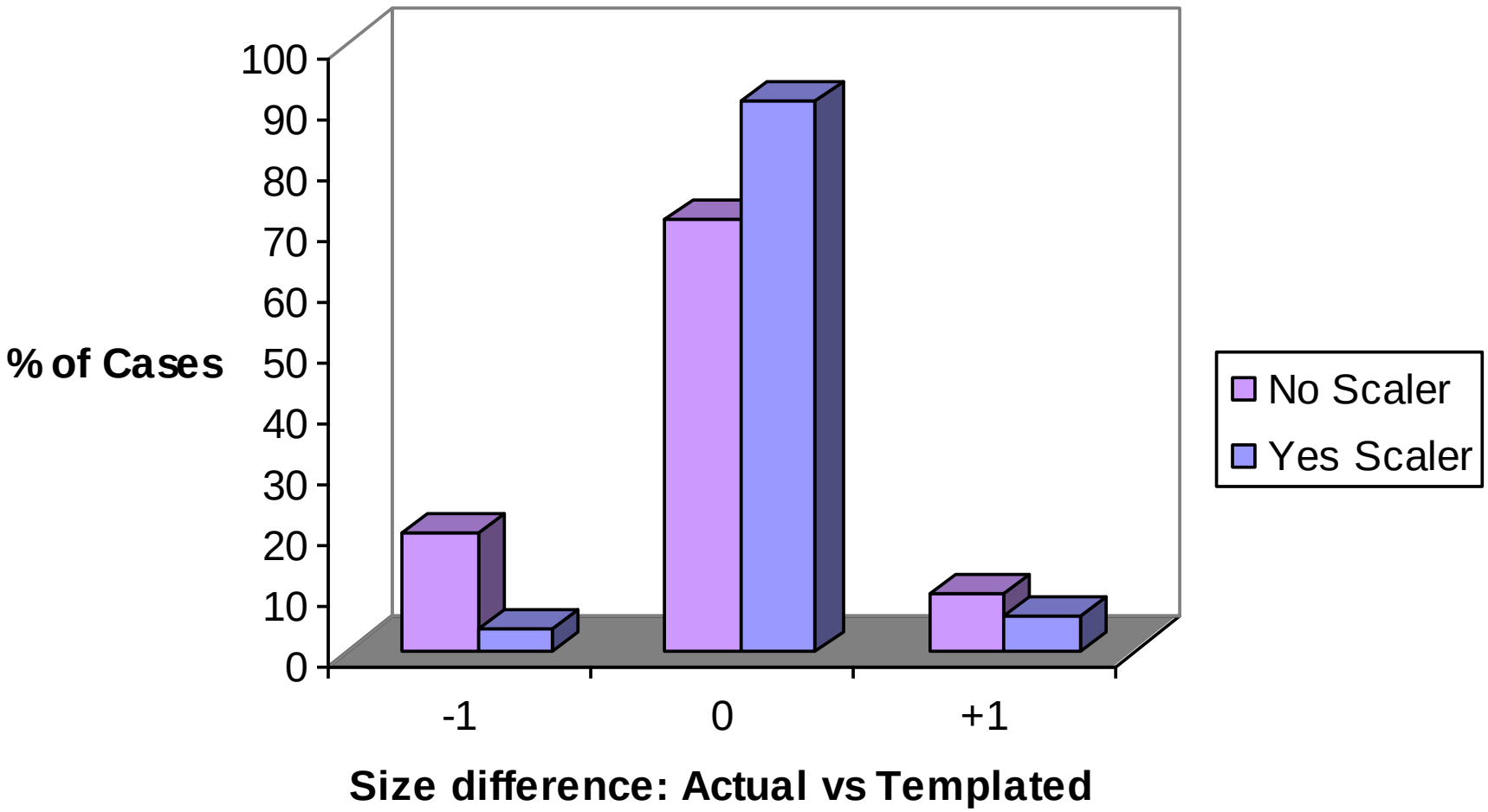
OrthoView
10:07 PM

Acetabulum


74% 0±1 difference
(NS)
76% 0 ±1 difference (S)
% of Cases
35
30
25
20
15
10
5
0
-2
-1
0
+1
+2
+3
+4
+5
No Scaler
Yes Scaler
Size difference: Actual vs Templated


Femoral Stem
82% 0 ± difference (NS)
93% 0 ±1 difference (S)
% of Cases
60
50
40
30
20
10
0
-3
-2
-1
0
+1
+2
+3
+4
No Scaler
Yes Scaler
Size difference: Actual vs Templated

Femoral Offset



Conclusion

- Does the use of a scaling marker improve accuracy of digital templating in THR?
  - Yes, more with Femoral stem
  - 93% accurate (Scaler) vs 82% accurate (Ruler)