

# How to Report Effectively on a Nuclear Cardiology Study

A/Prof. NATHAN BETTER

Cardiologist and Deputy Director of  
Nuclear Medicine

Royal Melbourne Hospital

University of Melbourne

December 2012

# The case

Let's look at the pictures first.

? Blinded.

? You know the clinical Hx + / or exercise data

Try all the tricks to normalise or minimise the findings – maybe!!

Use planar images if necessary

Supine, prone, AC, Gating

Patient Name:  
Study Date: 13/11/2012

Patient ID:

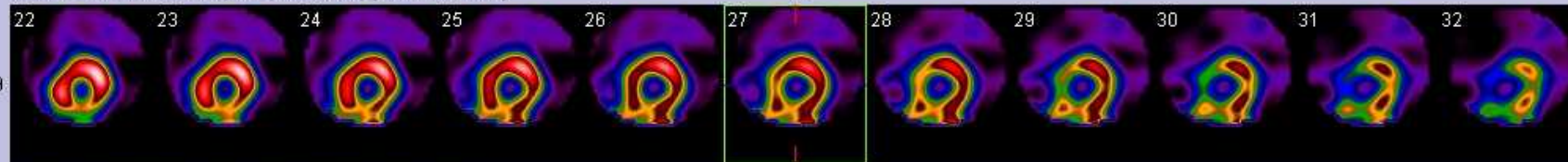
DOB:

Sex: M

Study Name: Myocardial Perfusion

Row B - Stress Gated Supine (Med Dose) [Recon - NoAC]

SA

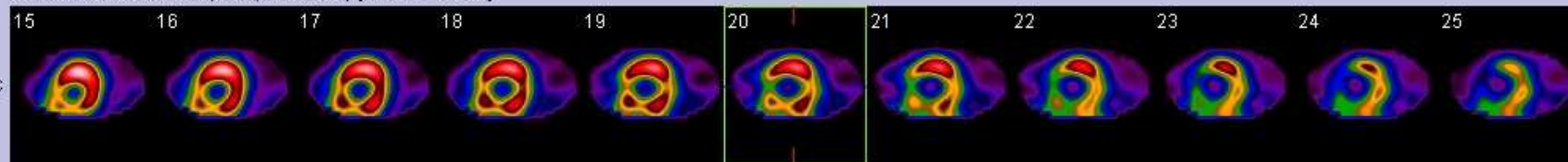


%



Anterior  
Inferior

Row C - Rest Gated Supine (Med Dose) [Recon - NoAC]

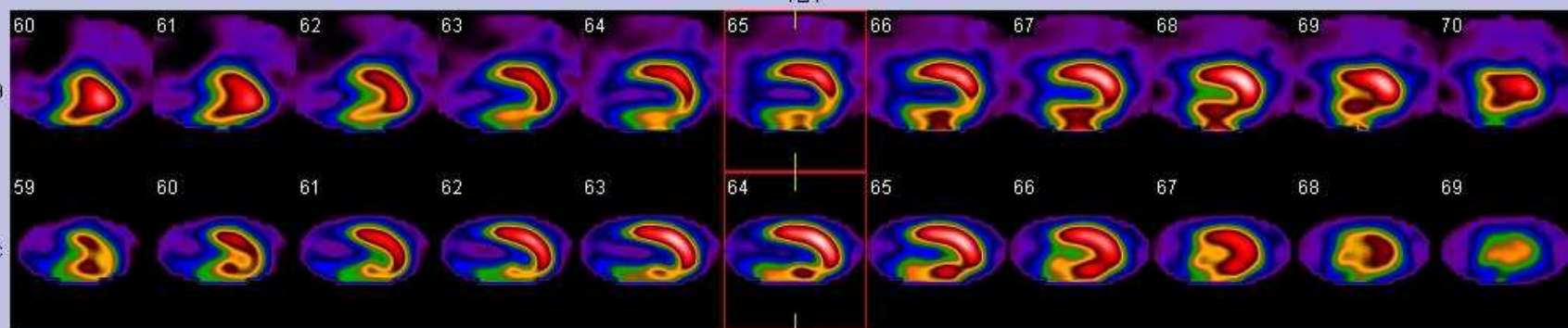


%



Apex  
to  
Base

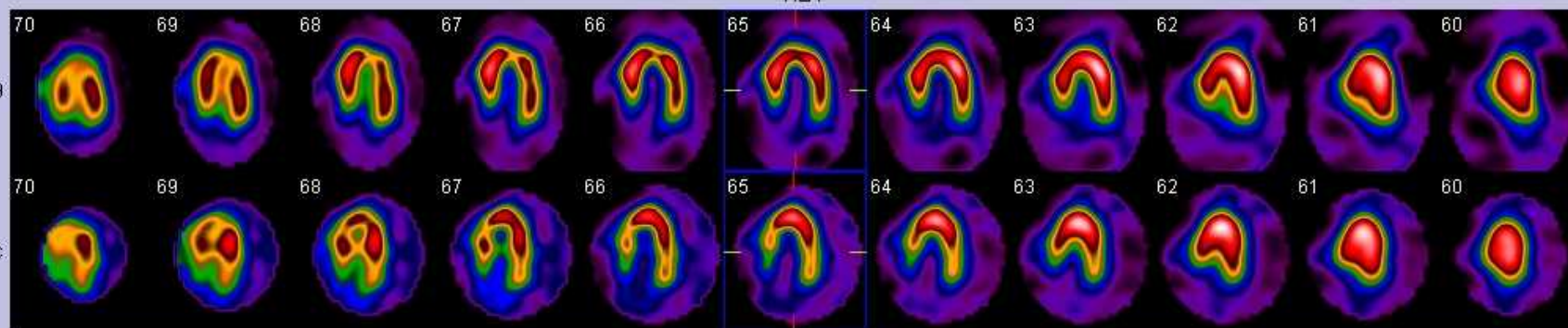
VLA



Anterior  
Inferior

Septal  
to  
Lateral

HLA

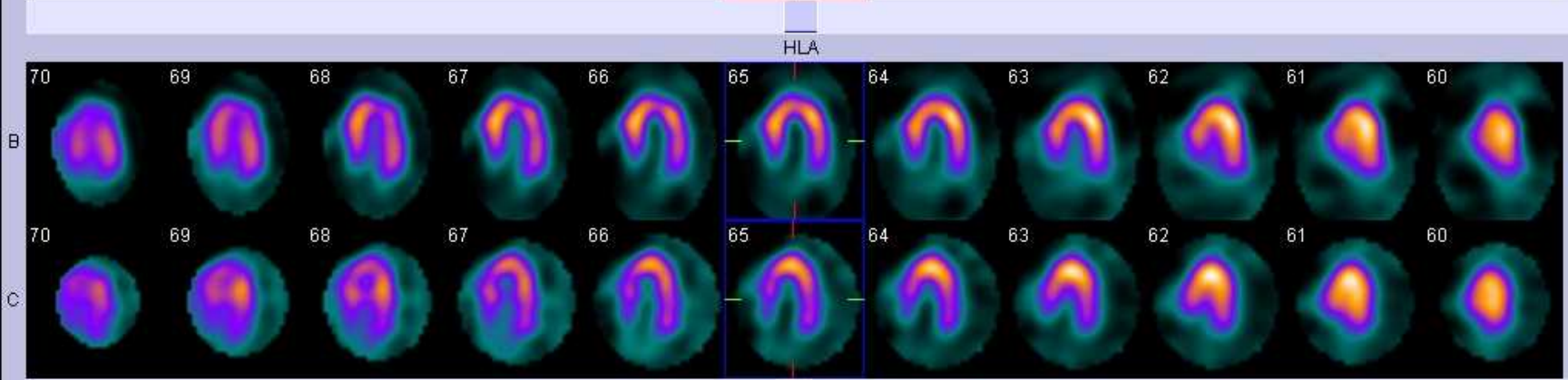
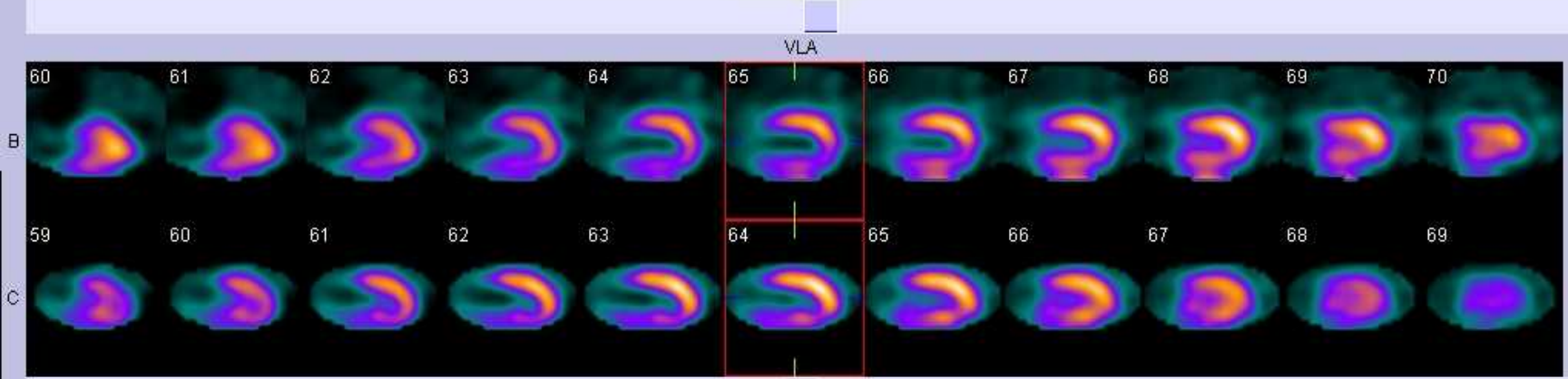
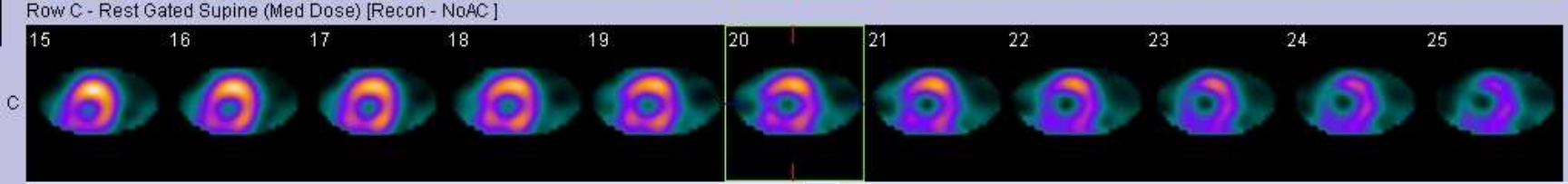
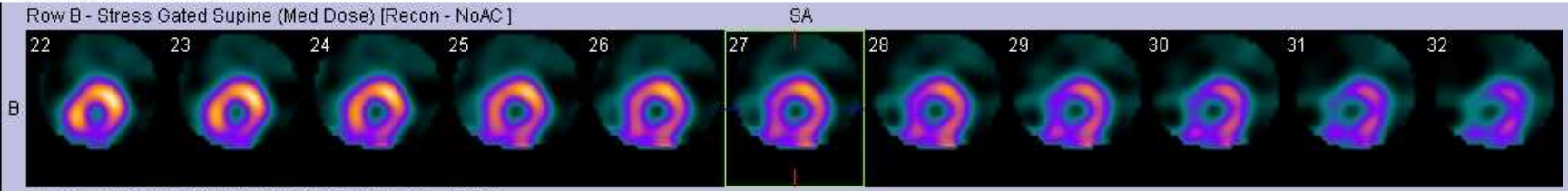


Apex  
to  
Base

Inferior  
to  
Anterior

Patient Name: Patient ID: DOB: Sex: M Study Name: Myocardial Perfusion

Study Date: 13/11/2012



100  
0

Septal

Anterior

Inferior

Apex to Base

Anterior

Inferior

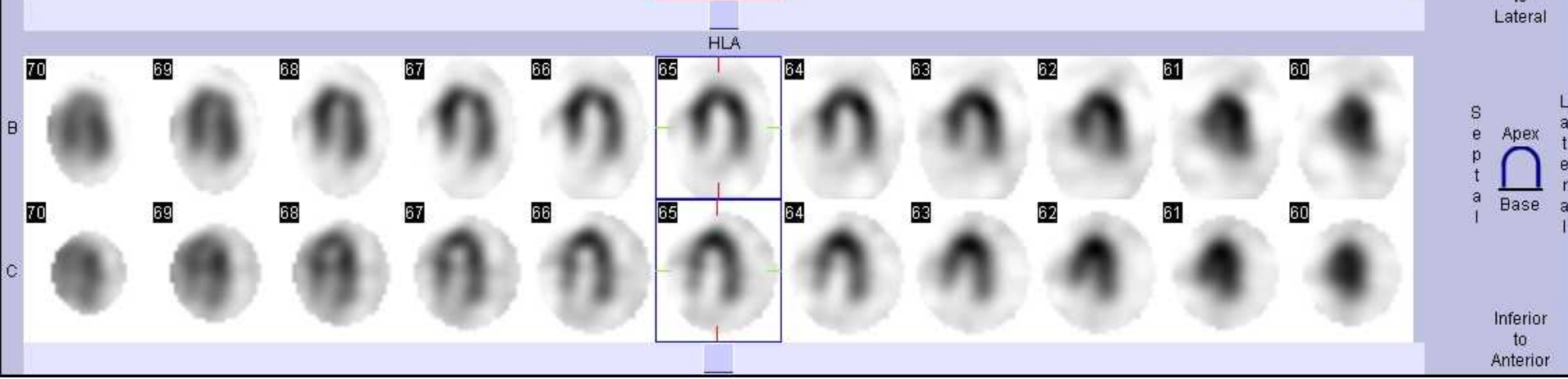
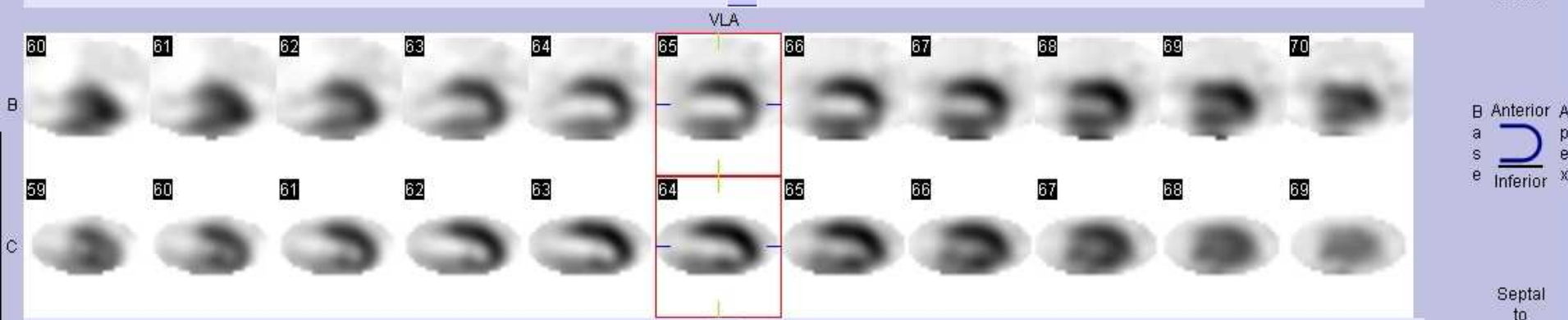
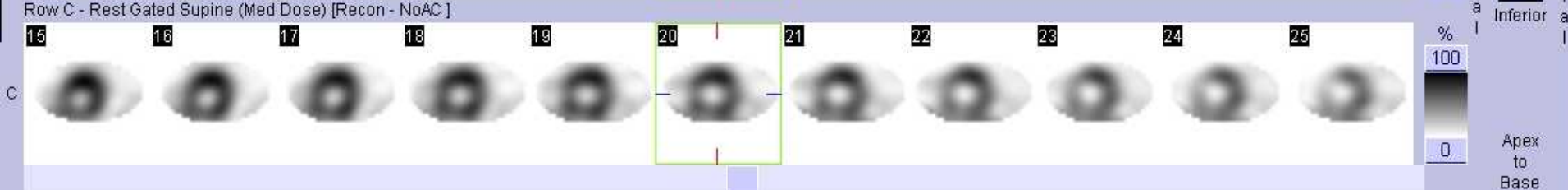
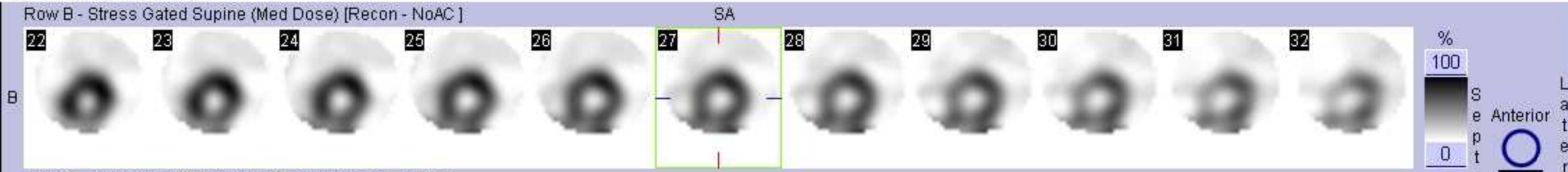
Septal to Lateral

Apex

Base

Inferior to Anterior

Study Date: 13/11/2012



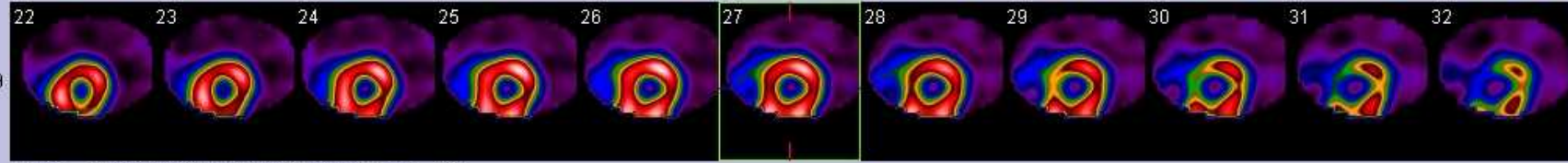
# Diagnosis

- ? Inferior ischaemia
- ? Apical ischaemia.
- What to do next??

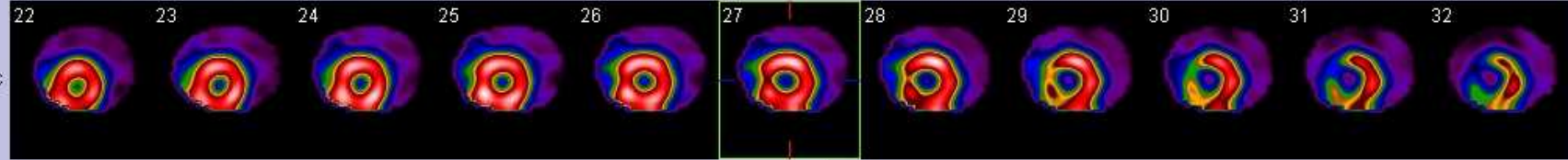
Patient Name: Patient ID: DOB: Sex: M Study Name: Myocardial Perfusion  
Study Date: 13/11/2012

Row B - Stress Gated Supine (Med Dose) [Recon - AC]

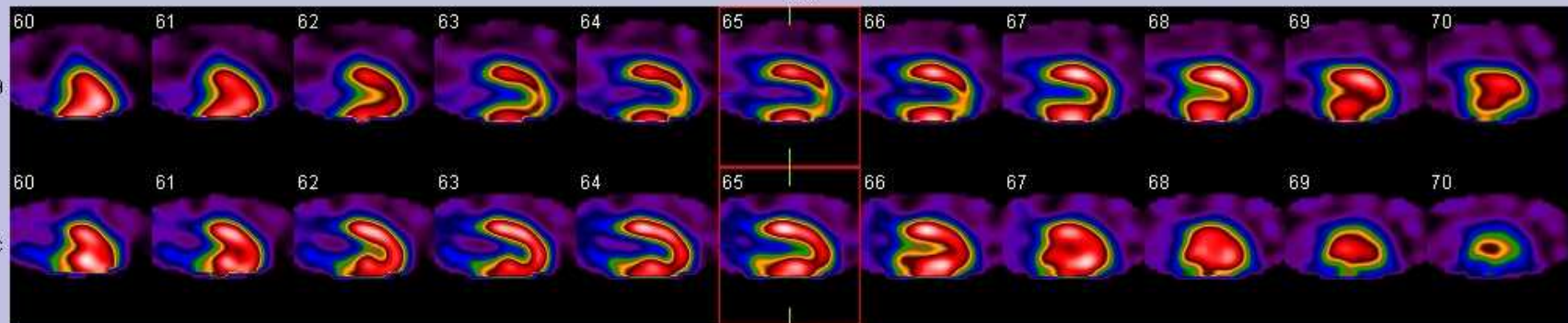
SA



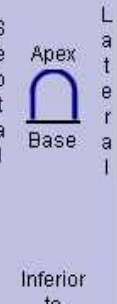
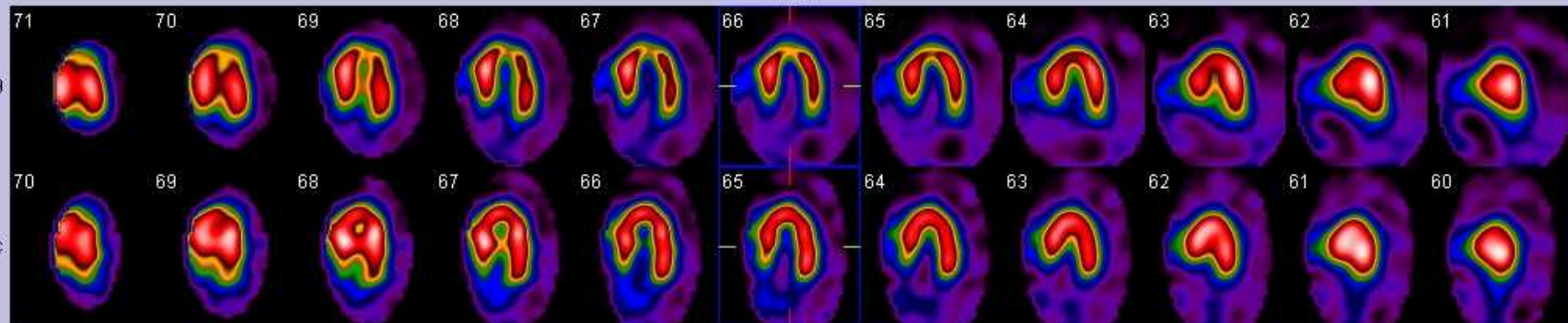
Row C - Rest Gated Supine (Med Dose) [Recon - AC]



VLA

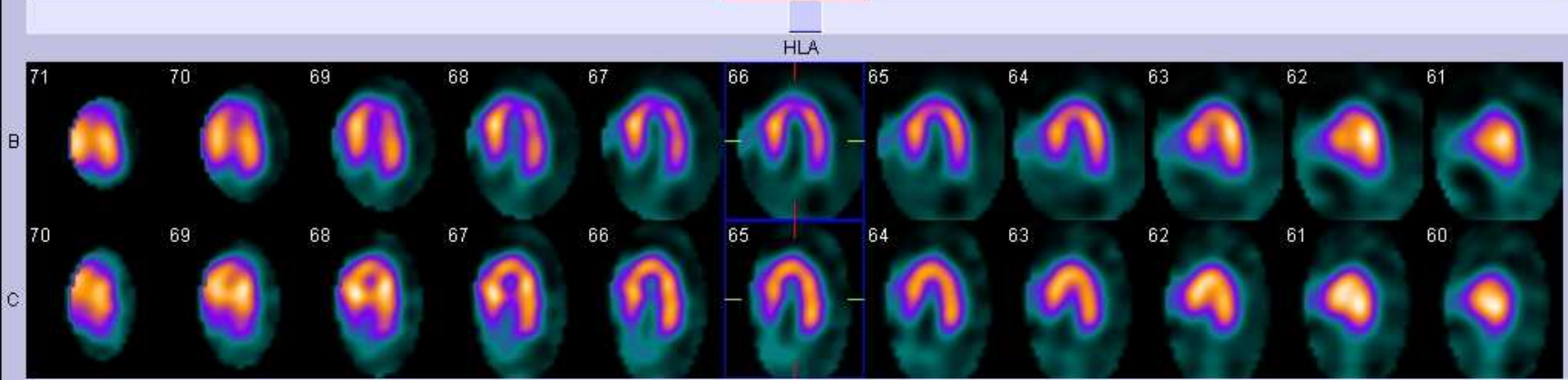
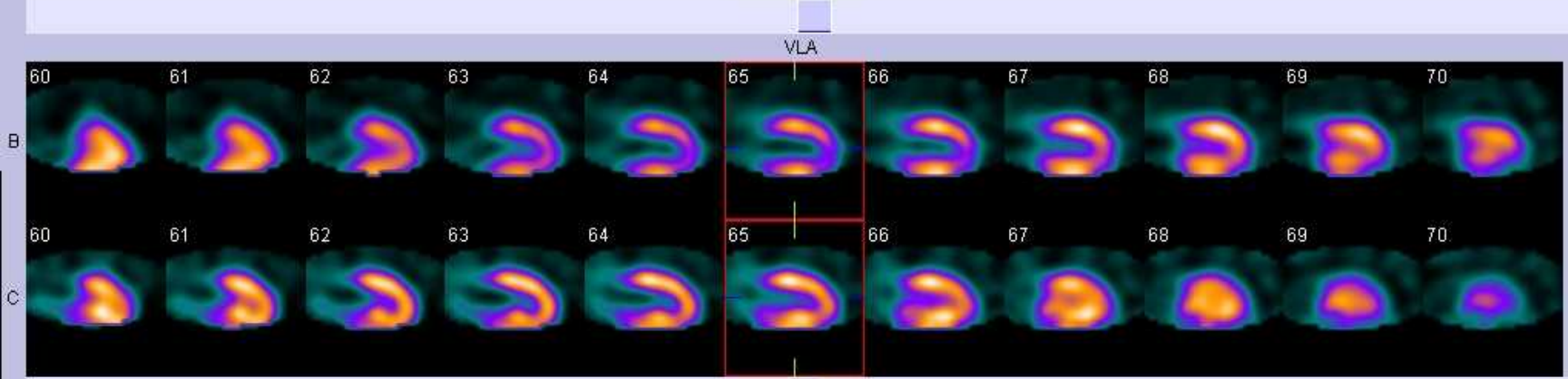
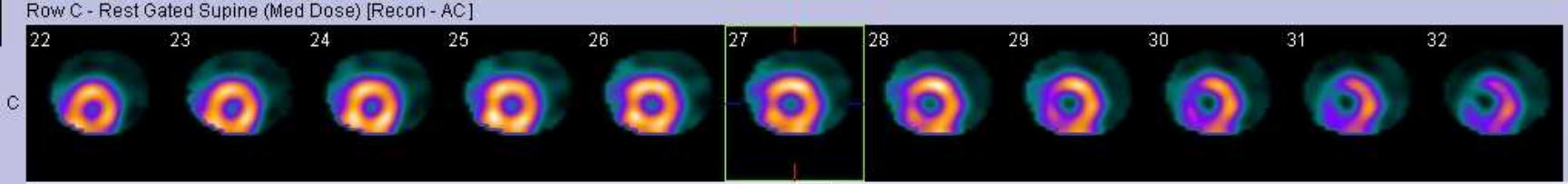
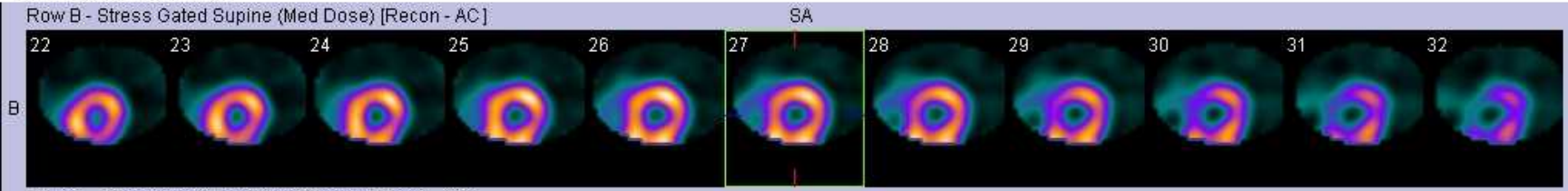


HLA



Patient Name: Patient ID: DOB: Sex: M Study Name: Myocardial Perfusion

Study Date: 13/11/2012



100  
0

Anterior  
Inferior

100  
0

Apex  
to  
Base

Anterior  
Inferior

Apex  
Base

Septal  
to  
Lateral

Anterior  
Inferior

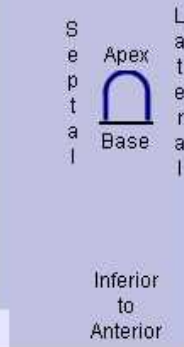
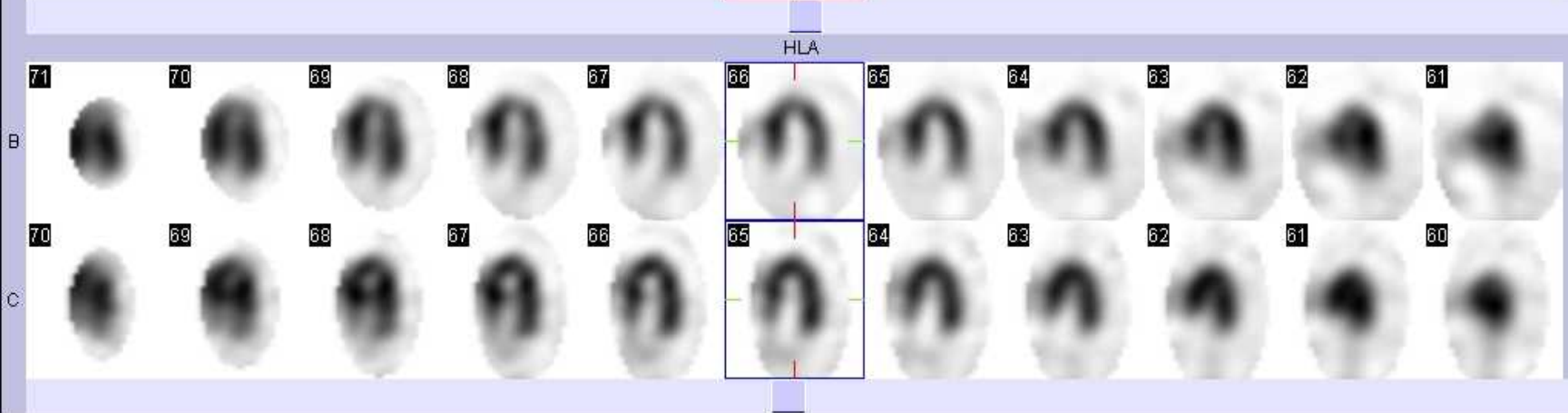
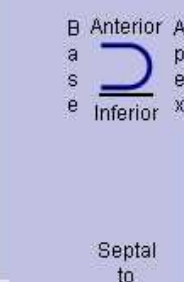
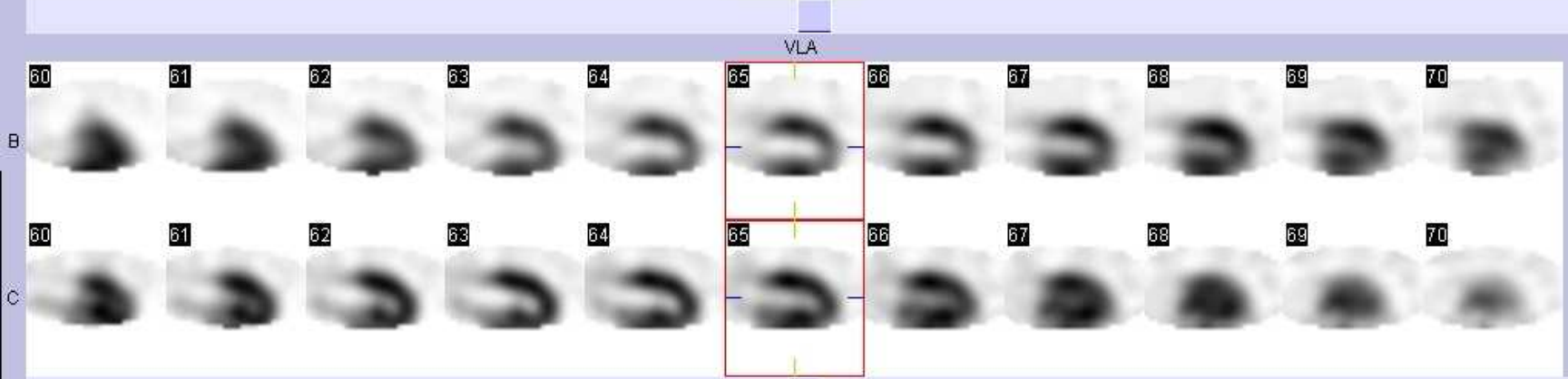
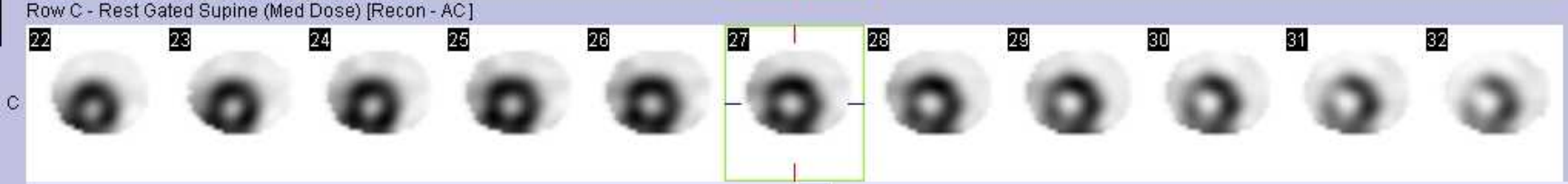
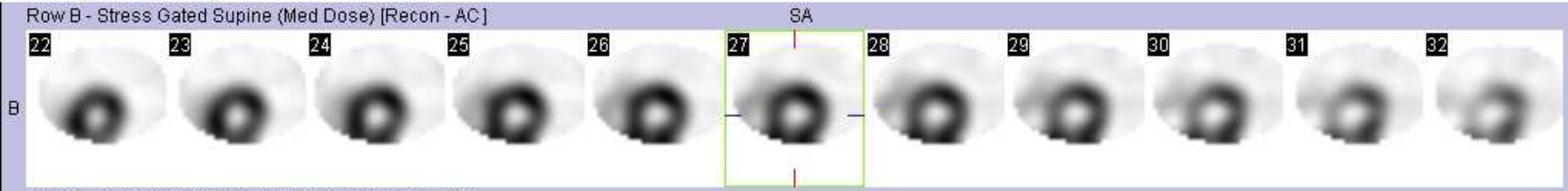
Apex  
Base

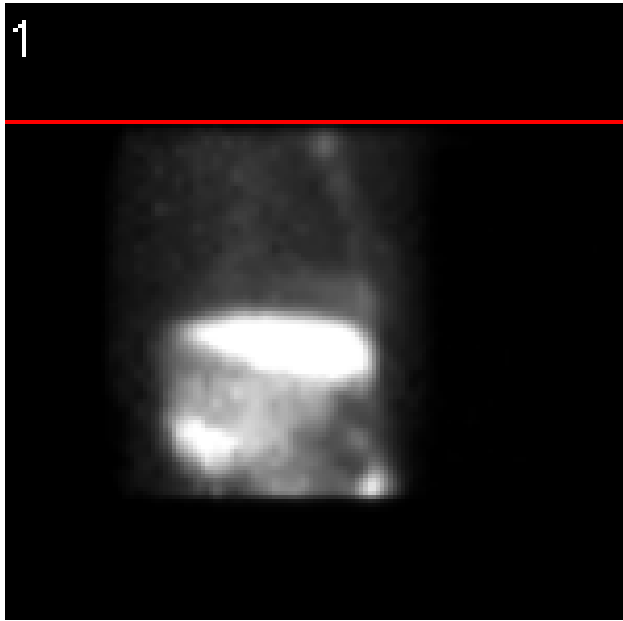
Inferior  
to  
Anterior



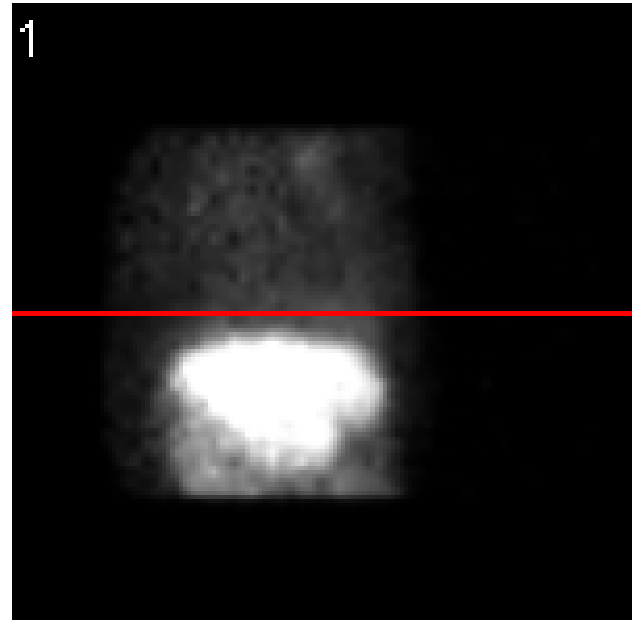
Patient Name: Patient ID: DOB: Sex: M Study Name: Myocardial Perfusion

Study Date: 13/11/2012

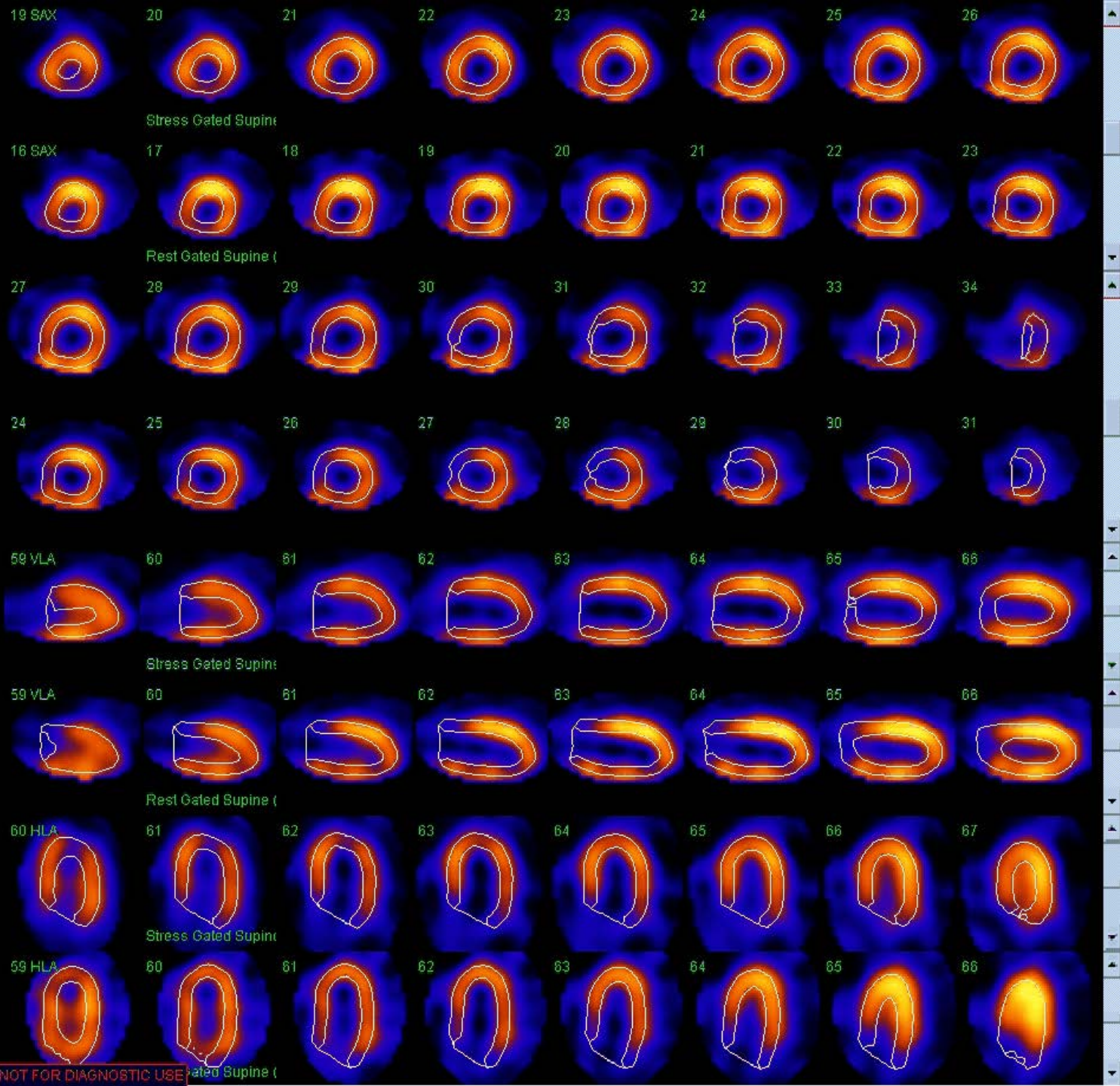


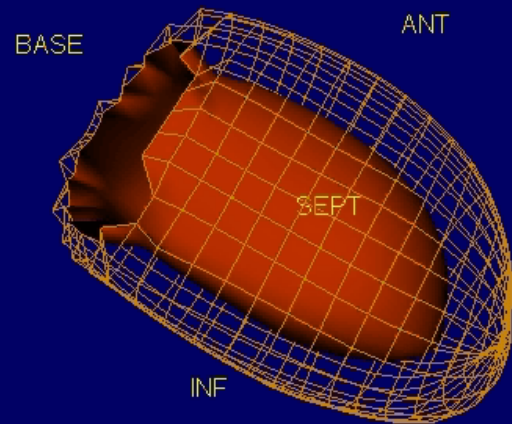


STRESS

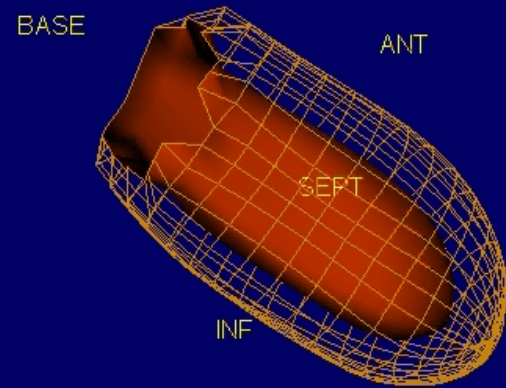


REST

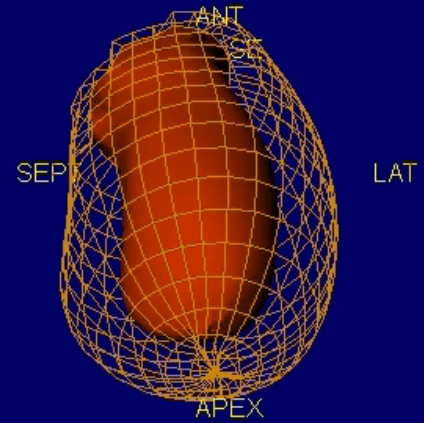
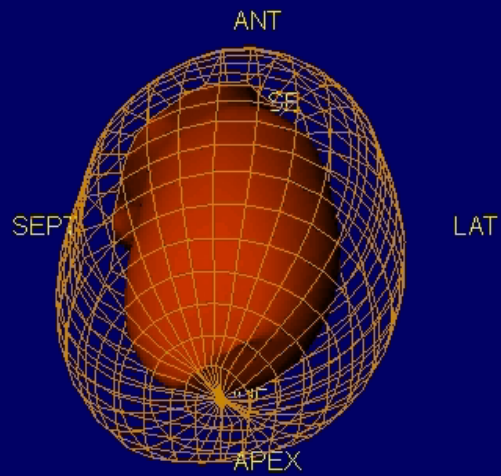




APEX



APEX

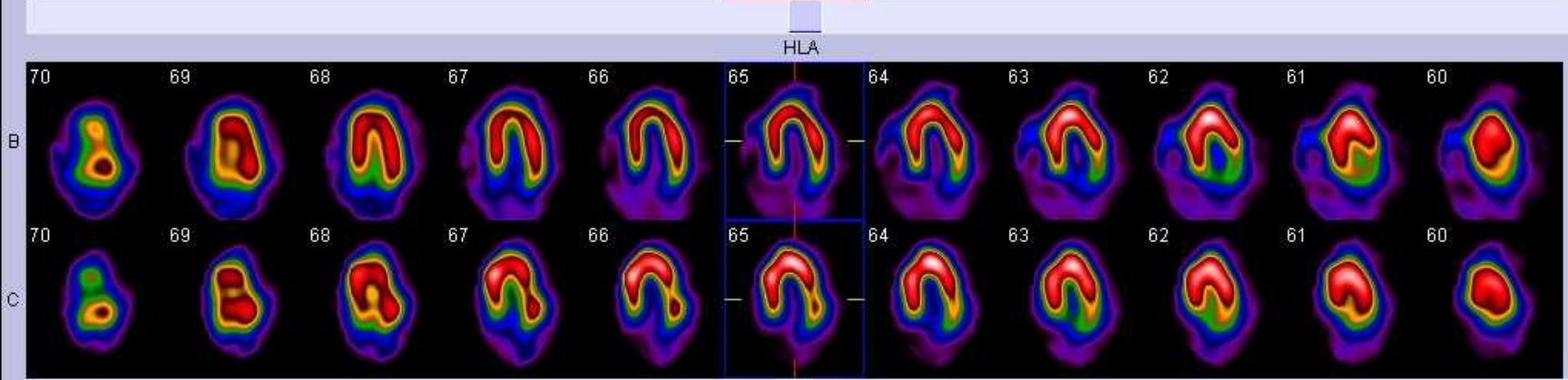
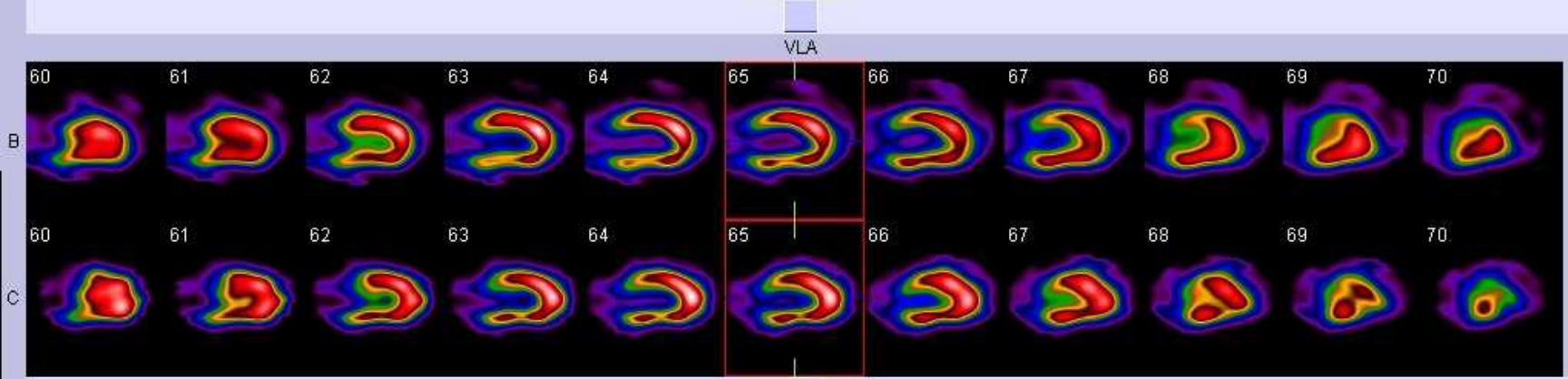
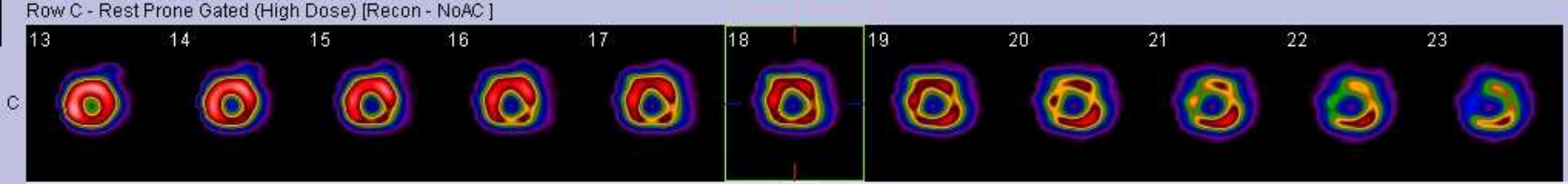
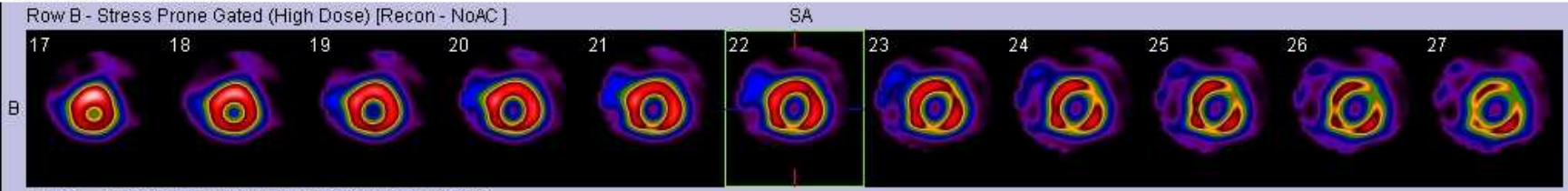


# Next case

- Real life.....

Patient Name: Patient ID: DOB: Sex: M Study Name: Myocardial Perfusion

Study Date: 31/10/2012



100  
0

Anterior  
Inferior

Apex  
to  
Base

Anterior  
Inferior

Septal  
to  
Lateral

Apex  
to  
Base

Anterior  
Inferior

Apex  
to  
Base

Inferior  
to  
Anterior

# Now the case

84 year old. Previously well. Creat 180.

Hx of hypertension on amlodopine.

Diabetic on metformin.

Exertional chest tightness for 6/12 - stable

Exam – Well. 150/90

Chest clear

CVS Normal

ECG – SR LAHB. Minor ST changes.



# Exercise data

10 minutes Bruce.

Peak HR 130

Peak BP 210/100

Mild pain at peak exercise

SR. 1 mm further ST depression over baseline  
(equivocal)

No arrhythmia

# Conclusion

The exercise MIBI study is mildly positive for reversible ischaemia at a high workload. A small amount of ischaemia is seen in the non-LAD territory as well as in the territory of a diagonal branch of the LAD. No major area of reversibility is detected.

“Code” – treat medically

Management – medical therapy.

# Now the case - again

36 year old. Previously well.

No past history

Exertional chest tightness for 1/12 – good story

Exam – Well. 130/90

Chest clear

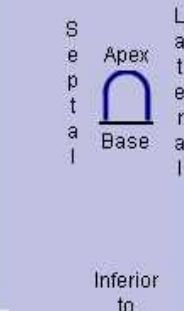
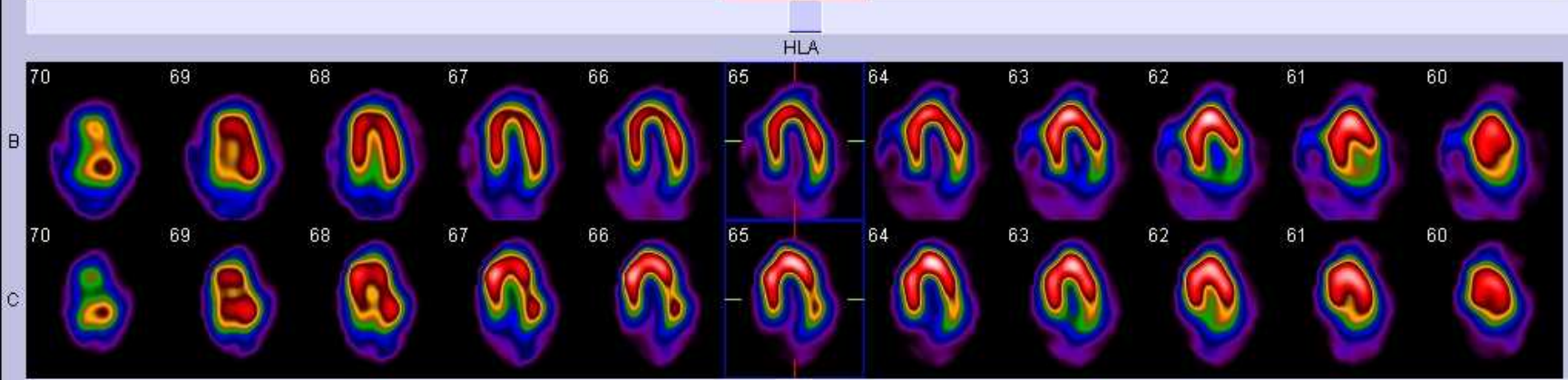
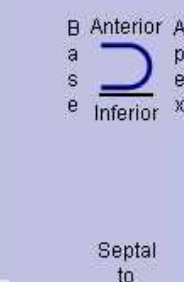
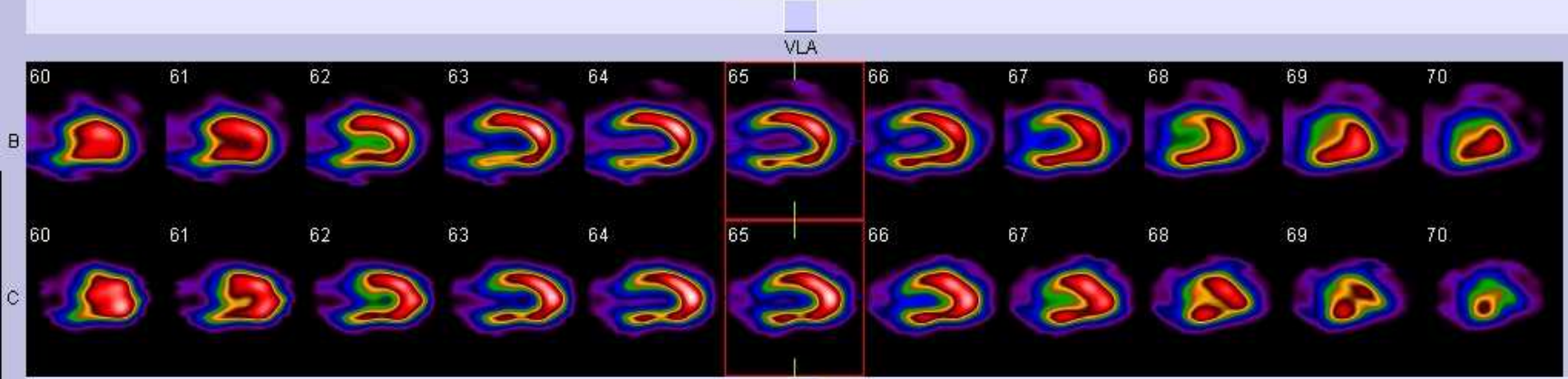
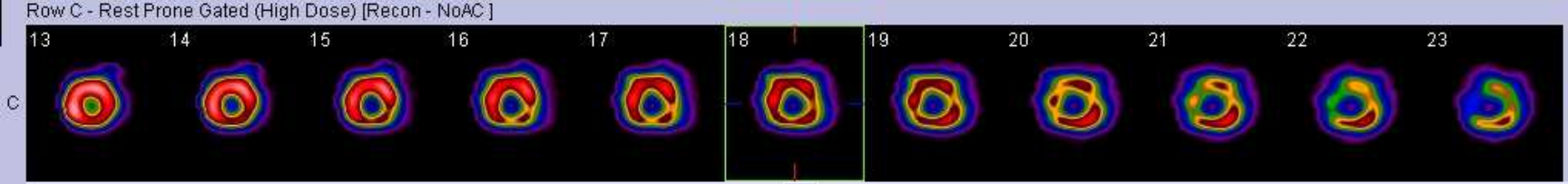
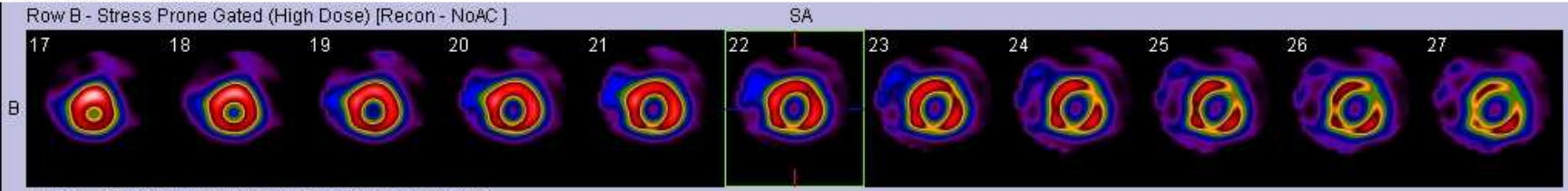
CVS Normal

ECG – Normal

Exercise – 12 mins Bruce. No pain No ECG changes

Patient Name: Patient ID: DOB: Sex: M Study Name: Myocardial Perfusion

Study Date: 31/10/2012



# Conclusion

The exercise MIBI study is positive for reversible ischaemia at a high workload. A small amount of ischaemia is seen in the non-LAD territory as well as in the territory of a diagonal branch of the LAD. In total, a moderate amount of ischaemia is seen.

“Code” – can treat medically or cath, but concern re age.

Management – cath.

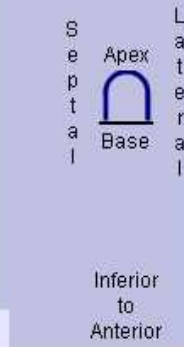
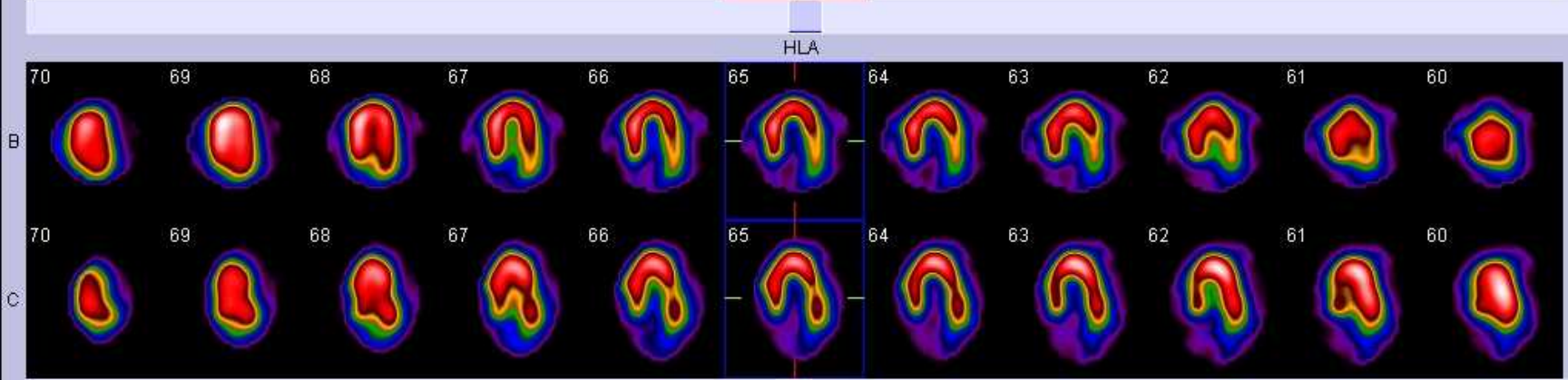
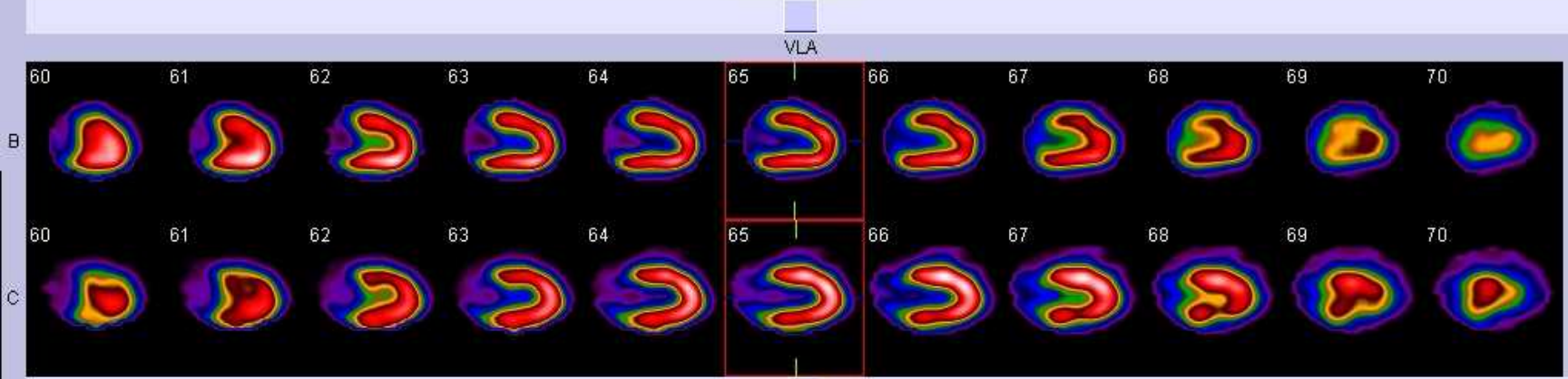
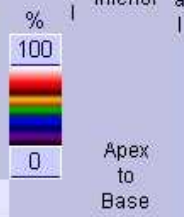
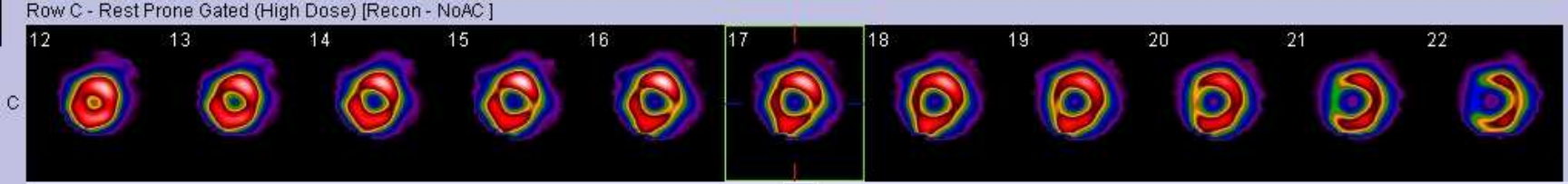
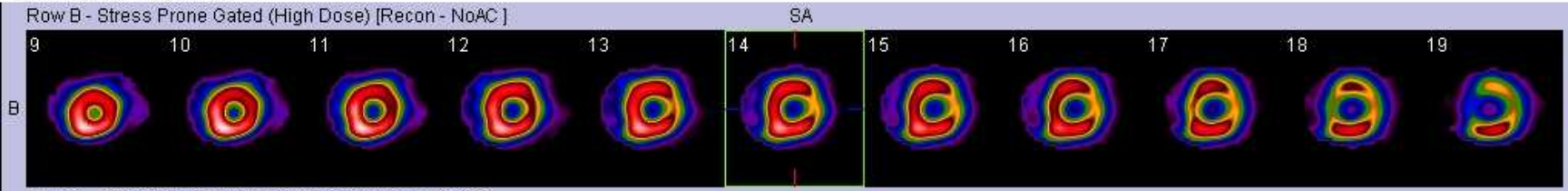
Talk to your referrers – teach them your code.

# Same images

- Different report
- Different management
- Next case ....

Patient Name: Patient ID: DOB: Sex: M Study Name: Myocardial Perfusion

Study Date: 19/09/2012



# Stylise the report

- Think Management
- Moderate Cx ischaemia
- The exercise performance and clinical history will guide you to think
  - 1. No therapy
  - 2. Medical therapy
  - 3. Cath +/- revascularisation





# Clinical Indication

- < 2 lines
- What is the question being asked?
- Diagnostic v. Prognostic

# Exercise data

- Protocol - exercise v. pharmacological +/-ex
- Duration
- Workload / energy /mets
- HR and BP – rest and peak (? Off meds e.g. beta blockers)
- Reason for termination
- Chest pain and equivalent
- ECG changes – ST, rhythm
- ? Abnormal HR or BP response

# Perfusion imaging

- Define the protocol – rest /ex or ex/rest. 1 or 2 day, etc
- Tc99m MIBI-tetrofosmin and/or Tl-201
- Nitrate imaging
- AC used
- Gating used
- Prone v. supine

# Perfusion results

- Be descriptive of EACH defect.
- Large, moderate, small size
- Severe, moderate, mild hypoperfusion
- Small, moderate or large amount reversibility.
- Comment - LV size, RV uptake, lung uptake, other (remember these are also oncological agents) at rest and stress.

# Gating results

- LV function
- Global and regional
- LVEF rest and exercise (? Change in LVEF)
- Diastolic function, especially in the correct clinical setting

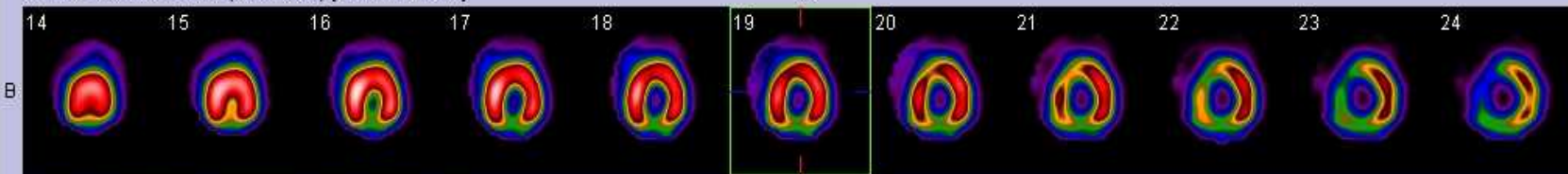
# CONCLUSION

- 5 – line rule
- Summarise everything. Take “all the small, moderates and larges” and define “in total, (e.g.) a moderate amount of reversible ischaemia is seen.”
- Remember – two identical reports could end up with different managements, depending on the clinical context, and who is reading it

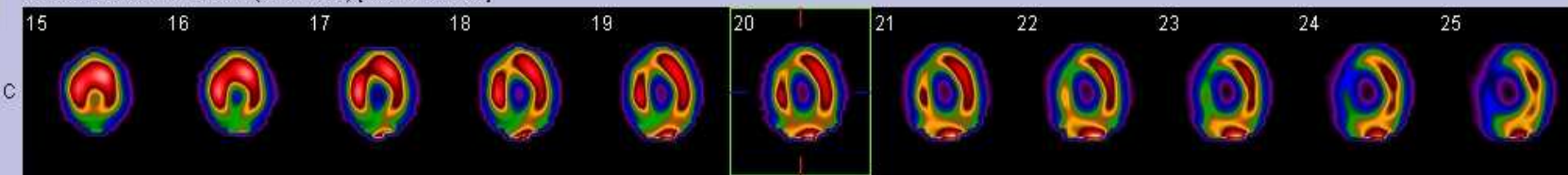
Study Date: 2/8/2012

Row B - Stress Prone 1 (Med Dose) [Recon - NoAC]

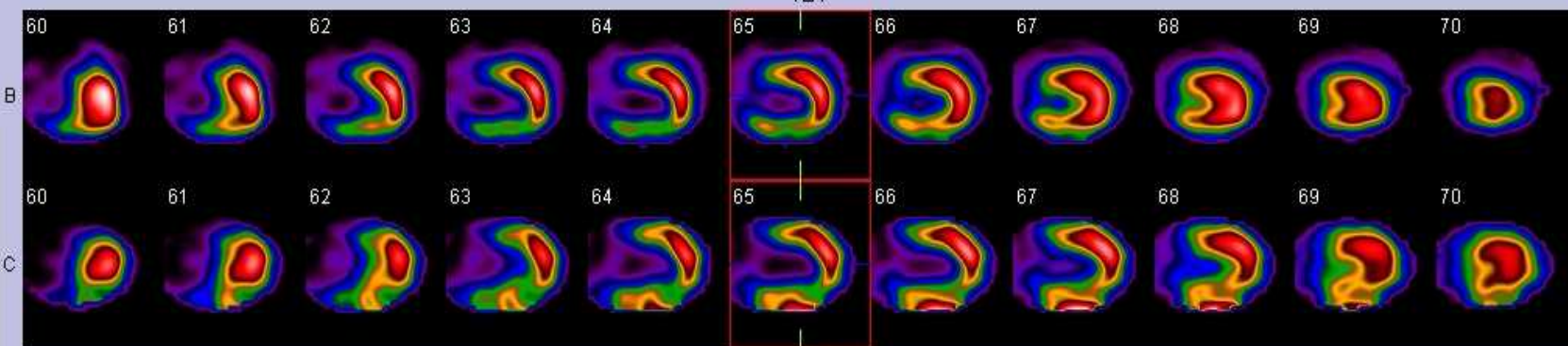
SA



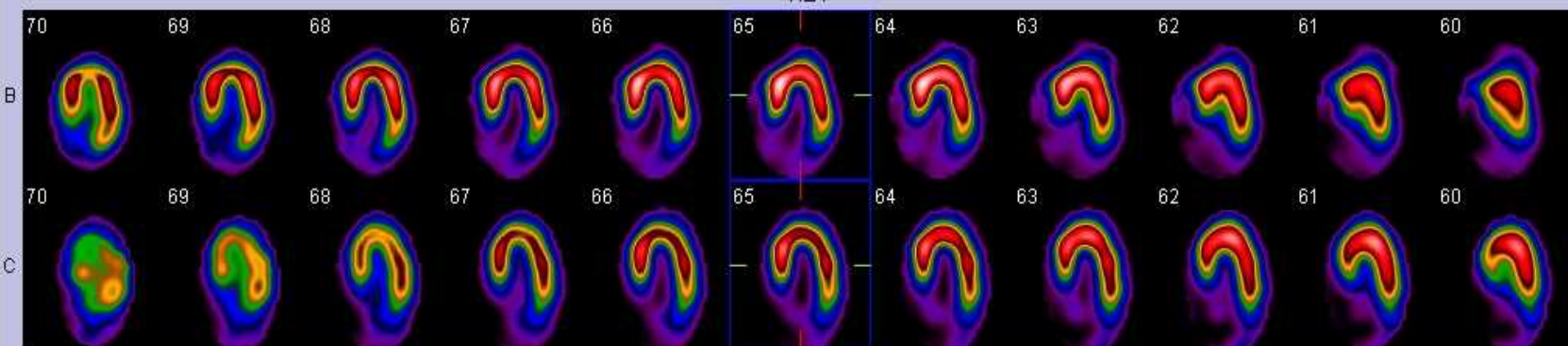
Row C - Rest Prone Gated (Med Dose) [Recon - NoAC]



VLA



HLA



Inferior to Anterior



# Pt A

- 83 year old man with CABG 5 years ago. Creat 200. Recurrent pain. Test done off metoprolol
- ECG 6 mins Bruce. HR 130 BP 200/80. No pain. 1mm lateral upsloping ST depression

## Conclusion

The exercise MIBI study is mildly positive for reversible ischaemia in the non-LAD territory at a high level of haemodynamic stress. The study was done off metoprolol and no major ischaemia is seen.

# Pt B1

- 39 year old male with positive F/H and very atypical pain. Weigh 120 kg.
- ECG 15 minutes Bruce. HR 170 BP 210/80. No pain and no ECG changes.
- This patient needs close review of exercise gating, supine v prone and AC. Maybe even thallium-201.

Conclusion – The exercise MIBI did not demonstrate definite scintigraphic evidence of reversible ischaemia at a very high workload. Patchy change in the inferior wall is most likely artefact.

Mx – risk factor control

# Pt B2

Conclusion – The exercise MIBI study is mildly positive for reversible ischaemia in the non-LAD territory at a high workload.

Here, the emphasis on mild ischaemia is less important because it is a diagnostic, rather than prognostic scan – now pt B2 will get a Cath while A and B1 will not.

This is your call.....

# So...

- Make your own template
- Use IAEA template if needed
- Know your patient
- Know your referrers
- Go to their meetings. The false positive ex MIBI with a normal cath is far less dangerous to your practice if you are at the meeting to explain the pitfalls.
- Remember sensitivity and specificity are 80-90 % but our strength is in predicting events



## Shortcuts

[Latest](#)[Events](#)[Links](#)[General Public Information](#)[Databases & Statistics](#)[IAEA Publications](#)[Go Back](#)

# Guidance and Recommendations for the Implementation of Nuclear Cardiology in Developing Countries

Dear reader, please note that this document is the result of a Technical Meeting on: "Evidence-based Nuclear Cardiology in Ischemic Heart Disease" held in Vienna on February 21–25, 2011. It reflects the contributions of participants to the meeting and has been further expanded and updated to be published as an IAEA Human Health Series.

## Contents

- [FOREWORD](#)
- [CONTENTS](#)
- [1. INTRODUCTION](#)
- [2. INDICATIONS FOR MYOCARDIAL PERFUSION IMAGING](#)
- [3. STRESS MODALITIES AND PROTOCOLS FOR MPI](#)
- [4. ACQUISITION AND PROCESSING OF MPI STUDIES](#)
- [5. INTERPRETATION AND REPORTING OF MPI STUDIES](#)
- [APPENDIX I](#)
- [APPENDIX II](#)
- [APPENDIX III](#)
- [APPENDIX IV](#)
- [APPENDIX V](#)
- [APPENDIX VI](#)
- [APPENDIX VII](#)
- [APPENDIX VIII](#)
- [ABBREVIATIONS](#)
- [CONTRIBUTORS OF DRAFTING AND REVIEW](#)

**RADIOPHARMACEUTICAL:** 99mTc Sestamibi, [] Mbq (Rest) / 99mTc Sestamibi, [] Mbq (Stress)

## CLINICAL INDICATION

## TECHNICAL PROCEDURE AND RESULTS

Stress test:

|                             |                               |
|-----------------------------|-------------------------------|
| Protocol - Bicycle          | Duration - [] mins.           |
| Peak workload - [] watts.   | Work - [] kJ.                 |
| Heart rate (bpm): Rest - [] | Peak - [] ( <u>{}% MPHR</u> ) |
| BP: Rest - []               | Peak - []                     |
| Reason for termination:     | []                            |
| Chest pain - []             |                               |

ECG Changes - []

Myocardial Perfusion Scan:

Tomographic images of myocardial perfusion were performed following the injection of 99mTc-Sestamibi at rest and again, following the injection of 99mTc-Sestamibi after stress.

Nitrate administered prior to rest injection - []

## OVERALL IMPRESSION

# CONCLUSION

- The five lines of your conclusion is the most important thing that you contribute – make it impact and make it count
- We have a wonderful gatekeeping tool – use it wisely and use it often!!
- Get involved with your referrers, be it cardiologists or family doctors.
- Don't be afraid of competing modalities and suggest appropriately to your referrers
- Most Importantly.....

- Thanks for inviting me to beautiful Myanmar!!!