

# Educational software for technologists – When to add SPECT/CT imaging to planar bone scanning

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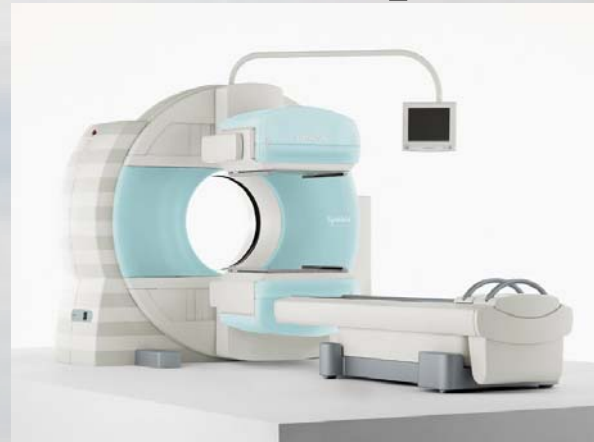
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Disclosure: Richter and Edenbrandt are shareholders in  
EXINI Diagnostics AB



# Background

- SPECT/CT + whole body bone scan
  - differentiate malignant from benign lesions
- Work flow
  - perform the two exams while the patient remains on the table



# Aim

- To develop an educational software for training and testing of all technologists performing bone scintigraphy



# Method

1. Establish criteria for when SPECT/CT should be added to a planar bone scan
2. Select 40 training cases of whole-body bone scans illustrating the criteria
3. Select 10 test cases, similar to the training cases except that the desired decisions were not immediately available



# 1 Criteria for SPECT/CT

## A) No SPECT / CT

- *No new lesions when compared to a previous scan*
- .....

## B) Perform a SPECT / CT

- *Focal lesions in the spine or pelvis*
- .....



# 2 Training cases

The screenshot displays a medical software interface with several panels:

- Patient:** Fall13 (M), Fall13, 2009-04-20
- Palette:** A grayscale calibration bar.
- Max and Min Thresholds:** Sliders for 0% and 32% with a 'Reset' button.
- Layers:** Checkboxes for Atlas, Hotspots, and Classification.
- Database:** EXINI bone 1.3
- Layout:** Grid icons for window arrangement.
- Export Image:** Options for Idle, Screen Capture, Save to Disk, and an Export button.
- Tools:** A help icon (?)
- Scan Selection:** Scan 1, Scan 2, Anterior, Posterior, CADx, Hotspots
- Image View:** Two posterior views of a human skeleton. The left image is dated 2006-mar-03 and the right is 2009-apr-20.
- Report Window:** Contains the following text:
  - Remisstext:** Rubricerade pat har en strålbehandlad prostatacancer i kurativt syfte 2000. Biokemiskt recidiv som över tid erhållit behandling med GnRH analog, antiandrogen, dvs Bicalutamid som nu är seponerat. I stället Escitaludin 80 mg givet var 4:e vecka i m. Sviktat även på detta och nu stigande PSA som närmar sig 50.
  - Typ av besvär eller skada:** Patienten anger inga besvär
  - Komplettering:** Ingen komplettering behövs.
  - Förklaring:** När det jämfört med tidigare undersökning inte finns nytillkomna patologiska upptag
  - Bedömning:** Progress av metastasmissstänkt förändring i bäcken. Nytillkommen patologisk förändring i ett revben vilken kan vara rest efter ej helt färsk fraktur men skelettm metastas kan ej uteslutas. Nytillkommen patologisk förändring i halskotpelaren sannolikt av degenerativ genes men skelettm metastas kan ej uteslutas. Inga nytillkomna metastasmissstänkta förändringar.
- Export Report:** Fields for Physician, Referring Department, and Referring Physician. Checkboxes for PDF, XML, RTF, PNG, JPG, RS-JPG, and CSV. Save and View buttons.

Clinical information

Desired action – SPECT/CT or not



# 3 Test cases

The screenshot displays a medical software interface with the following components:

- Patient:** Test09 (M), Test09, 2010-10-14
- Palette:** A color calibration bar.
- Max and Min Thresholds:** Sliders for 0% and 50% with a 'Reset' button.
- Layers:** Checkboxes for Atlas, Hotspots, and Classification (checked).
- Database:** EXINI bone 1.3
- Layout:** Viewport icons for Anterior, Posterior, and CADx.
- Export Image:** Options for Idle, Screen Capture, Save to Disk, and Export.
- Tools:** A help icon (?)
- Scan 1:** Anterior and Posterior views of a skeletal scan from 2010-10-14.
- Report:** A form with the following sections:
  - Remisstext:** Nyupptäckt prostatacancer, lokaliserad sådan med Gleason 5+4. Tacksam för skelettscint. Viss ryggvärk föreligger.
  - Typ av besvär eller skada:** Patienten anger inga besvär
  - Komplettering:**
  - Förklaring:**
  - Bedömning:**
- Export Report:** Fields for Physician, Referring Department, and Referring Physician, with checkboxes for PDF, XML, RTF, PNG, JPG, RS-JPG, and CSV.

Clinical information

Desired action not available



# Results

6 technologists /10 test cases = 60 decisions

<b>Technologists Decision</b>	<b>Desired SPECT/CT</b>	<b>Action No SPECT/CT</b>	<b>Total</b>
SPECT/CT	30	8	38
No SPECT/CT	0	22	22
Total	30	30	60

Technologists did not miss to perform SPECT/CT when needed





# Conclusion

- Criteria, Training cases and Test cases have ensured that all technologists have the required knowledge to decide when to perform a SPECT/CT
- Improve effectiveness



# Work in Progress

## Step 4

- In clinical routine technologist make a decision before consulting the physician
- 100 cases
- If positive results in step 4, technologist will take decision SPECT/CT or not in the clinical routine



# [www.numema.se](http://www.numema.se)

- Criteria
- Educational software
- Comments and suggestions appreciated

