

Clinical cases from Mehiläinen Turku

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Customer background information

The Mehiläinen Group is one of the biggest and well-respected providers of private healthcare and social services in Finland. The group had approximately 2.4 million customer visits in the year 2012.

Mehiläinen Turku offers specialist and general practitioner, occupational healthcare and surgery hospital services as well as comprehensive laboratory and imaging services. The imaging department at Mehiläinen Turku is the largest one in the Mehiläinen Group and completed over 17 000 plain X-ray, 1700 mammography, 3800 ultrasound, 600 osteoporosis and 2500 MRI examinations in 2012.

At the end of summer 2012 we had in Mehiläinen Turku two computed radiography (CR) laboratories. However we felt that it was time to upgrade to Digital Radiography (DR) equipment. After a thorough evaluation of different equipment and vendors in Finland, we decided to buy a Samsung XGEO GC80 DR system – the second XGEO GC80 system that was sold in Europe.

Purchasing new models on the market always comes with a risk, but we trusted Samsung as a company. Samsung is a well-recognized global brand and Samsung Electronics have an outstanding reputation for producing excellent electronic devices. From the customer's viewpoint it is also very important that the local dealer is a well-known player in medical business. This assures us that we will get service and maintenance if needed.

Our patient material has broad spectrum from paediatrics to elderly people. This sets the performance demand very high; X-ray systems must be flexible and image processing must be able to produce good image quality even though the examined body parts can vary in size and body density.

Radiation dose and image quality

“In our experience with Samsung XGEO GC80 we can say that the dose is lower compared with CR systems. According to our experience, in chest and cervical spine examinations, the dose is 35% lower when using XGEO GC80.”

We have been using XGEO GC80 now for over 14 months. During that time we have customized the image quality to satisfy our needs. As a private healthcare company it is essential for us to be able to provide the best service/care possible, and a lower dose than that of competitors is always a strong argument for attracting patients. We also want to maintain our strong position in the private market by investing in and using the latest technology. The implication of this is that when we upgrade from CR technology to DR technology the dose should be lower without reducing the image quality.

Beside dose and image quality, workflow and speed are important factors when operating in the healthcare business. Customers are expecting smooth examinations and swift results with minimal waiting time throughout the process/procedure.

Image acquisition with Samsung XGEO GC80 DR system takes only 3-5 seconds per image. In a study with two image acquisitions the waiting time is only 10 seconds. In older technologies the waiting time was always almost one minute per image. Image acquisition workflow DR gives us almost 1 minute and 50 seconds advantage. Fast patient flow is very important during busy hours and all our customers are very pleased with the faster and smoother process.

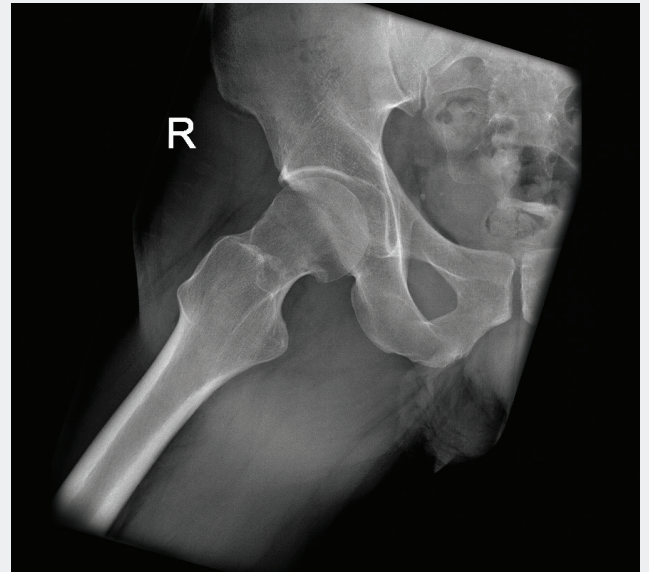
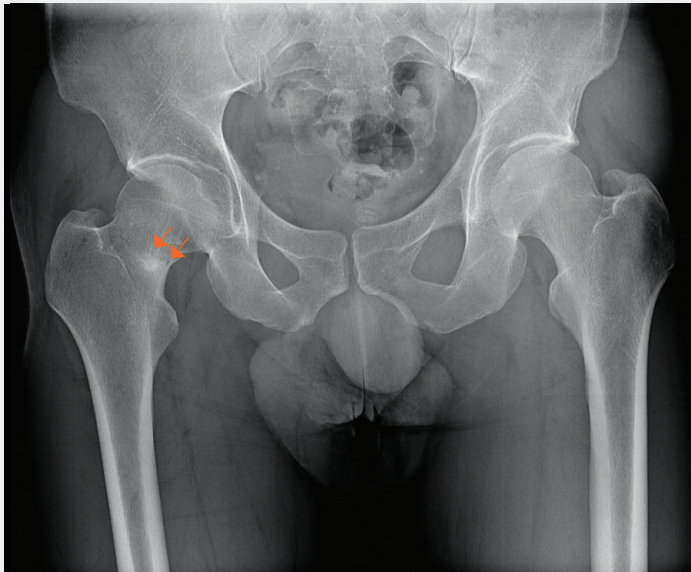
“When comparing our old CR images to images that are taken with Samsung XGEO GC80, our new image quality has improved and is mostly excellent.”

Our goal is to make the dose level even lower which will be possible when we have even more experience with the system. To adjust image quality and balance the radiation dose is a form of art; we need to keep this process as part of our daily work routines.

A helpful tool is the Smart Stitching function; the X-ray tube and the detector move automatically when a long-bone-image for instance thigh or leg is being captured. It captures two or more images consecutively and then stitches the images into one. For a radiologist it is easier to interpret one image instead of two or three images.

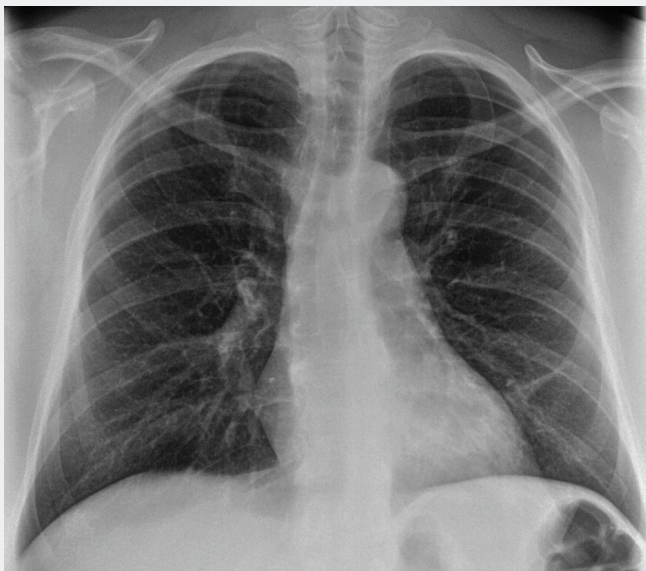
Here are some examples of our images with case explanations.

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CASE 1

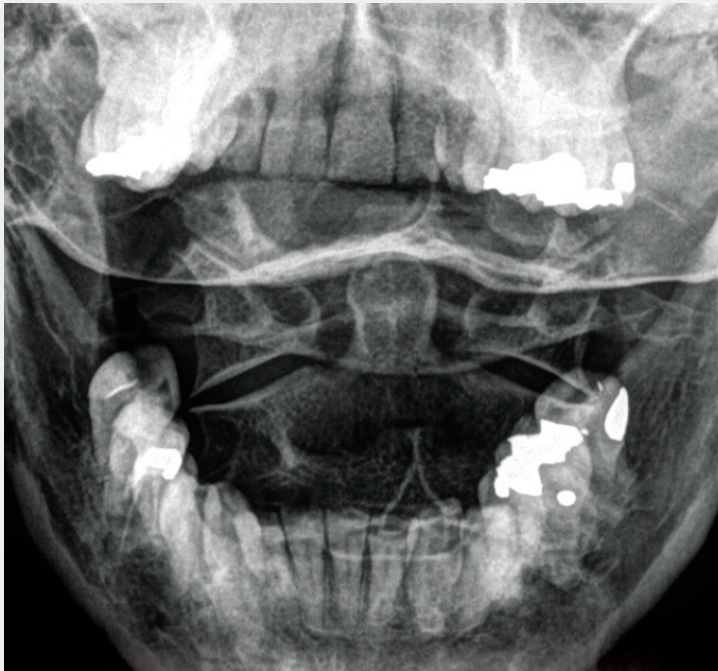
- Patient age: 48
- Gender: Male
- Patient conditions: Bicycle accident
- Diagnosis: Medial collum femoris fracture



CASE 2

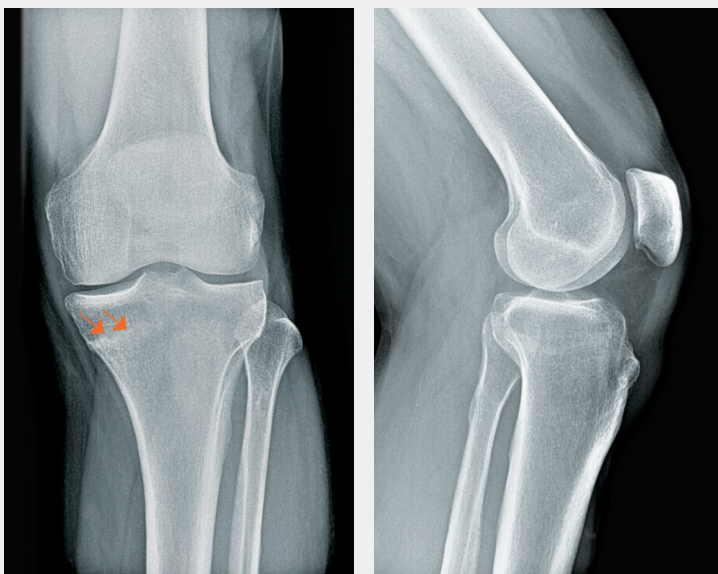
- Patient age: 46
- Gender: Male
- Patient conditions: Long lasting flu and auscultation was normal
- Diagnosis: Pneumonic infiltration in the left lower lobe behind the heart

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CASE 3

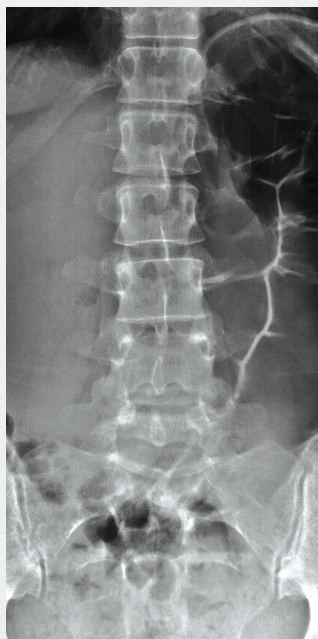
- Patient age: 59
- Gender: Female
- Patient conditions: Whiplash accident when falling on her face
- Diagnosis: Fracture in the upper frontal corner of the 5th cervical spine. The tiny fracture fragment is visible. This fracture was not visible on MRI.



CASE 4

- Patient age: 42
- Gender: Male
- Patient conditions: Acute pain in the left knee after jogging. The first x-ray was normal. After two months still pain and new x-ray examination.
- Diagnosis: Sclerotic zone in the medial condyle of tibia (stress fracture)

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CASE 5

- Patient age: 29
- Gender: Female
- Patient conditions: Lumbar back pain after training crossfit
- Diagnosis: Spondylolysis et – osthesis in the 5th lumbar spine



CASE 6

Two different stitching cases when using stitching in the bucky table.



CASE 7

- Patient age: 9
- Gender: Female
- Patient conditions: Young football player who had long time pain in the left knee
- Diagnosis: Radiolucent ring surrounding the bony fragment in the medial condyle (osteochondritis dissecans)

Summary about sample images: Good image quality helps us radiologists to interpret the images. Faster diagnosis helps us to maintain our fast workflow.

Samsung XGEO GC80 - More comfort and safety

AUTO POSITION SYSTEM TAKES WORKFLOW AND PATIENT SAFETY TO THE NEXT LEVEL

Radiographers Marika Larkovuo & Nina Rinne / Mehiläinen Turku

Customer background information

The Mehiläinen Group is the most respected and well-known provider of private health care and social services in Finland. In 2012 there were approx. 2.4 million customer visits throughout the year. Mehiläinen Turku is one of the group's 27 medical centers (Mehiläinen website 09/2013). Mehiläinen Turku offers general practitioner-, occupational health services and comprehensive specialist services. In Mehiläinen Turku's medical center there is a large doctor's clinic for children, exercise clinic and a GP for surgeon's emergency duty. Our imaging centre is open every day. There are 11 radiographers in our department. On average over 375 plain X-ray examinations are made weekly. Mammography, ultrasound, osteoporosis and MRI examinations are made by appointment.



Samsung XGEO GC80 was installed in August 2012 giving us one year of experience with the system. We have two plain X-ray examination rooms, one with XGEO and other with an older CR-system. There are two detectors in our XGEO system, one fixed in the wall stand and one wired portable detector. Our patients are usually in good shape and therefore examinations are executed standing when possible. We take images of extremities so that the portable detector is on top of the table. The portable detector is inside the Bucky-table only when imaging can't be made in upright position and requires a grid. About 58 % of our examinations are scanned with the wall stand's detector.

"We are very pleased how XGEO eases our daily work. XGEO moves almost by itself, so we don't have strained shoulders, elbows or wrists. We have now more time to discuss the examination with our patients and provide them with the best care possible. Our radiographers are very pleased working with XGEO and many say that it has increased their motivation."

Samsung XGEO has a special feature, Auto Position, which separates it from other X-ray systems. Auto Position enables tube movement with a single press of a button. You can control everything with two remote controls and two foot switches. XGEO has one remote control for universal use and one only for the wall stand. With the universal remote control you can move the X-ray tube, the table and the wall stand. The wall stand remote control has controls to operate the X-ray tube and the wall stand. XGEO is easy to move with the remote controls, all the symbols are understandable and the tube's moving directions are color-coded. The user can define different default Auto Position settings for each protocol. Several settings can be made for one subject. Once appropriated procedure is selected, a single press of the Auto Run button will move both the tube and the wall stand or the table to the pre-set position.

The Auto Position system allows the user to easily position the X-ray tube aligned with the detector through the help of a button click on the remote. For example, when in need to take an x-ray of the chest, it would usually require a lot of manual maneuvers but now it can be completed without even touching the equipment. Not only does this save time allowing for faster procedures and reduced waiting time for patients; it also reduced the body strain on the user that comes with repetitive movements throughout the day, allowing a more comfortable work environment.

Auto Position settings are easy to manage by your own. It's easy for radiographers to set specified Auto Position from XGEO's Anatomical Programmed Radiography-settings (APR). Radiographer needs to set XGEO in the right scanning position and choose 'get THU'. The system takes specific measures from the Tube Head Unit (THU), the wall stand and the table and memorizes those in the imaging protocol. This way it's easy to modify XGEO to your own needs. A certain Parking function can be used to automatically move XGEO to a specific safe place that provides more space to the room e.g. for cleaning at the end of the day.

Samsung XGEO GC80 - More comfort and safety

We have also modified our XGEO so that it moves to different positions, regardless of imaging protocols. For example, when imaging the hip in lateral position across table, we push one specified Key position-button and the system turns the X-ray tube towards the Bucky-table and raises the table so that it's easier to place a movable loose support for the detector and the loose grid. When we are scanning a hand, an elbow or a wrist, we can move the X-ray tube to the other side of the Bucky-table where the portable detector is located, again just by pressing a Key position-button.



For timesaving, we often call in our patients while XGEO positions itself. If the patient is in a wheelchair or a hospital bed, you can set the tube and the table apart from each other just by pressing the Park button on the THU, which allows fast



and easy access for the patient to get on and off the table. XGEO has 6 anti-collision sensors to prevent collision with people or objects. Sometimes there are students or patients' relatives in the examination room, who don't know how the system moves, so it's very important that nobody gets hurt. You can also stop the tube's movement by pushing the touch screen on the THU. Big 12" touch screen enables changing imaging parameters from the examination room, quick view of images, as well as confirming or rejecting images. This feature with Auto Position provides faster workflow, because we don't have to move XGEO ourselves or walk to the XGEO workstation to make changes to the parameters.



"This way we can also spend more time with the patient and whether it's a child or an elder who needs extra attention."

There is no need for lingering at the XGEO workstation checking if the image is acceptable when we can go straight back to the patient after we have acquired the image. It's easy to change imaging order or switch receptor on the THU if the patient gives new information that affects the examination.



"Since XGEO positions itself we have more time to communicate with the patient and focus on helping the patient and concentrate on the imaging itself. It makes the radiographer's work smoother and much more ergonomic."

It speeds up the whole imaging process and as a result more patients can be imaged in the same time. Customers don't have to wait so long and we can serve them with less hurry.

Samsung XGEO GC80 - More comfort and safety

Auto Position-function comes handy also in cases where there are several different examinations to be made to the same patient. For example if we have a patient who has thorax and sinus X-rays to be imaged. We can first take two thorax-images, and then we ask the patient to dress up and remove all objects from the head area and push a button to move XGEO ready for the next imaging. In the meantime the radiographer can accept the previous images and make adjustments if needed. This increases workflow and speed because we can use the time more profitable compared to moving the system manually. Another example can be presented when imaging a knee. If there hasn't been a trauma we first take a PA image where the patient is standing in front of the wall stand and the tube is angled 110 degrees cranio-caudal. The second one, lateral image of the knee, is imaged with the tube perpendicular to the wall stand. Again,

one push of the Auto Run button after the PA image will move the tube to the correct position. When XGEO is moving, we can talk with the patient and let them know more about the examination and answer their questions. Before moving the system to the right place took much more time and attention. Now we can focus on the patients and their needs.

We have noticed that we can discharge congestions faster than before XGEO was installed in our department. With XGEO we can take examinations 50% faster compared to our CR system. It takes about 10 minutes to take thorax images with CR system and only about 5 minutes with XGEO. Therefore about 80% of our examinations are imaged with XGEO. In 2013 we have taken about 12000 plain X-ray examinations until the end of the summer, in 2012 there were over 17000 X-ray examinations over all.



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For more information

For more information about Samsung XGEO GC80, visit www.samsung.com/healthcare



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