Insights Imaging (2015) 6 (Suppl 1):S449–S457
DOI 10.1007/s13244-015-0389-x

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Satellite Symposia (D)

Wednesday, March 4

10:30 - 12:00 **Studio 2015**

SY 1

The power of MRI in breast diagnostics and therapy

Moderator:
S.H. Heywang-Köbrunner; Munich/DE

Future trends in breast MRI: TWIST-VIBE for breast cancer staging in 2 min
R.M. Mann; *Nijmegen/NL*

Breast MRI has obtained a solid position in the radiological evaluation of the breast. Its 3-dimensional nature allows for an easier understanding of the location and extension of abnormalities within the breasts. The large amount of information that can be obtained using different scan sequences allows for a much better understanding of the biological processes taking place within breast abnormalities. The criticism which has accompanied breast MRI is usually fed by the relatively high costs of the procedure. In screening for breast cancer, costs are the sole issue that have prevented MRI screening programs to extend beyond the population with hereditary breast cancer. This can be partly solved by differentiating the women that currently undergo breast MRI by indication, i.e. a women with known breast cancer for whom the possible success of a chemotherapeutic regimen is questioned should undergo a completely different MRI scan than a women being screened for a moderately increased risk. This differentiation has been hypothesised upon, but has not really been implemented in clinical practice. Nevertheless, new protocols have been described that perform a complete evaluation of the breasts much quicker than conventional multiparametric MRI. TWIST-VIBE for example documents the inflow of contrast and provides morphologic information as well as information on tissue composition whilst it can be obtained in less than 2 minutes. The question is subsequently how to use this to our advantage, rather than adding it again to the already lengthy breast MRI protocol.

MR for operation planning
C.K. Kuhl; *Aachen/DE*

Breast MRI: insights from recent clinical trials
J. Barkhausen; *Lübeck/DE*

More than 30 years ago MRI emerged as a new technique in clinical breast imaging and over the last three decades numerous clinical studies have shown excellent results for the detection and characterisation of breast lesions. However, despite this tremendous gain in knowledge breast MRI still has its share of controversies including appropriate indications for screening and appropriate indications for preoperative breast MRI. In this lecture, the results of the most recent clinical trials addressing these topics will be presented in a comprehensive manner and the impact of these studies on daily clinical routine will be discussed. Additionally, there are several new indications for breast MRI bearing in mind that breast cancer subsumes different diseases with varying histologic subtypes, clinical presentations and treatment responses. Therefore, several studies aim to investigate the associations between MR imaging features and breast cancer subtypes as well as treatment responses. The second part of the lecture will give an overview on the recent efforts to characterise cancer subtypes and to support individualised tumour treatment based on quantitative parameters extracted manually or semiautomatically from multiparametric breast MRI data sets.
Learning Objectives:
1. To gain knowledge on the results of the most recent breast MRI trials.
2. To discuss the impact of the results on the management of breast lesions.
3. To learn about future developments and applications.

Positive long-term results after implementing intensive breast MRI use in an area population
J. Camps Herrero; *Valencia/ES*

Breast MRI has asserted itself as the most sensitive breast imaging modality for the diagnosis of breast cancer. Yet, two randomised controlled trials (COMICE and MONET) have failed to demonstrate that it can improve re-excision rates as a staging tool in patients with breast cancer. A recent randomised clinical trial (POMB), albeit with a large proportion of mastectomies in the MRI arm, has proven that breast MRI does reduce significantly the rate of re-interventions. As it stands, breast MRI is not included in the guidelines as a staging tool. In the geographical Spanish area of La Ribera we have been using breast MRI intensively since 2002, not only as a staging procedure, but also in patients treated with neoadjuvant chemotherapy, patients with a personal history of breast cancer, hereditary breast cancer risk, high-risk lesions, suspicious nipple discharge, microcalcifications, BIRADS 3-5 or distortions and in general as a problem-solving tool. The data we herein present will show that not only staging MRI can reduce the re-excision rates in patients with a diagnosis of breast cancer, but is also an excellent modality that, due to its high negative predictive value, can save additional biopsies and surgery. The future of radiology belongs to the development of imaging biomarkers and breast MRI is an excellent image biomarker of angiogenesis and cellular density that provides us with a static and dynamic complete image of a tumour in all its heterogeneity and complexity.

12:15 - 13:45 **Studio 2015**

SY 2

Multimodality lunch symposium: planning and control of breast cancer therapy

Moderator:
C. Van Ongeval; Leuven/BE

Introduction
C. Van Ongeval; *Leuven/BE*

Strain imaging ultrasound technology (virtual touch IQ)
M. Golatta; *Heidelberg/DE*

Strain imaging ultrasound technology as Virtual Touch IQ (VTIQ) is a new method being used in breast ultrasound. Strain imaging in general has multiple fields of application in assessing the stiffness of tissue. Reports are found on the assessment of liver, thyroid, kidney, prostate and breast tissue. Concerning breast ultrasound strain imaging is mainly used in the assessment of lesions. Based on the first study results, elastography is mentioned in the 5th BIRADS® catalogue and has been added as a further assessment method. There are various methods of elastography allowing a qualitative assessment on the one hand freehand elastography or quantitative assessment on the other hand ShearWave Elastography, e.g. VTIQ of either lesions or breast tissue. Elastography is a non-invasive radiationless diagnostic method which allows further assessment of breast lesions. Various studies have been able to show an increase of the diagnostic specificity without loss of sensitivity when combining the standard ultrasound BIRADS® classification with elastography. The improvement of the specificity will help to eliminate unnecessary breast biopsies in the future.

Value of digital breast tomosynthesis for preoperative local staging of breast cancer
L.J. Pina Insausti; *Pamplona/ES*

Digital Breast Tomosynthesis (DBT) is used as an additional technique after Digital Mammography (DM) in two main scenarios: first, to increase the detection of malignant lesions after normal mammography, especially in dense breasts; second, DBT can be used as a problem-solving technique when a lesion is detected on DM. We hypothesised that preoperative DBT could help to detect additional cancers not detected on DM, changing the initial surgical treatment. The aim of this study is to assess the role of DBT in the preoperative assessment of patients with recently diagnosed breast cancer. For this purpose, we conducted a retrospective lesion-based study of 91 patients with histologically proven breast cancer. All of them underwent DM, DBT and MRI. An expert radiologist who was blinded for the final diagnoses reviewed both DM and DM in conjunction with DBT. The gold standard was surgery (after MRI and second-look US information). The PEPI software was used to calculate the sensitivity and the statistical significance. 122 malignant lesions in 91 patients were our gold standard. DM detected 71 cancers and DBT discovered 23 additional cancers (+32.4%). The sensitivity of DM was 58.2%, the sensitivity of DM+DBT was 77.0% and the difference was statistically significant ($p<0.05$). The initial surgical treatment changed in 22 patients (24.1%), from conservative treatment to mastectomy in 5 patients (5.5%) and from lumpectomy to wider excision (but conservative) in the remaining 17 patients (18.6%). DBT increases the sensitivity of DM, detecting up to 32.4% additional cancers and changing the initial surgical treatment in 24.1% of patients.
Learning Objectives:
1. To study the role of preoperative DBT in breast cancer patients.
2. To show the changes induced by DBT in the initial surgical treatment.

Whole body MRI: changing the management paradigm for metastatic bone disease
A.R. Padhani; *London/UK*

Metastatic breast cancer to bone has detrimental impact on patients' quality and quantity of life. Since treatments are palliate, the control of bony metastatic disease is vital in maintaining patient health for as long as possible. The treatment of advanced breast cancer with bony metastases has significant health economic implications. To effectively manage patients it is essential to have consistent, reproducible and validated methods of assessing response to therapy. A review of biology of bone metastases and measures of response assessment including clinical assessment, tumour markers and imaging techniques (BS, CT, PET, MRI and whole body diffusion-weighted MRI (WB DW-MRI)) will be presented. The current standard of care of BS and CT has significant limitations and is not routinely recommended for response assessment in the bones. Morphologic response criteria on MRI have a number of problems including (1) arrested resolution of abnormalities despite effective therapy, (2) evaluating disease activity on scarred background is problematic, (3) T1-pseudoprogression due to bone oedema, (4) the sclerotic progression phenomenon, and (5) mixed response patterns. Therapy assessments on WB-DWI are made by observing changes in the volume and symmetry of signal intensity abnormalities on high b-value images together with changes in ADC values and distinct patterns are recognised. Cross-correlating DWI with morphological appearances remains important. WB- MRI has the potential to address the unmet need for assessing metastatic breast cancer.
Learning Objectives:
1. To know the indications for imaging metastatic breast cancer patients.
2. To learn how to perform whole body MRI in a time efficient manner.
3. To learn about the benefits of whole body MRI in addressing limitations of current imaging for bone metastatic detection and response assessment.
4. To understand the how the biology of metastatic bone disease affects imaging findings.
5. To be able to enumerate patient care indications for whole body MRI in metastatic disease.

Integration of molecular diagnostics in breast imaging
P.A. Fasching, R. Schulz-Wendtland; *Erlangen/DE*

Modern breast imaging methods have opened the way to personalised medicine in radiology similar to the treatment of breast cancer patients. In treatment and also in prevention, personalised medicine is either already a part of standard care or is about to be implemented in daily practice. Experience with molecular markers and predictive tests for breast cancer risk and breast cancer prognosis is the ideal basis for integrating molecular diagnostics into imaging methods. This can happen either by integrating the visualisation of certain molecules into the imaging method or by utilising established molecular markers for established diagnostic procedures like mammography screening or breast diagnostic procedures in daily routine. Here, we report on the current knowledge, how to utilise validated molecular markers together with breast imaging methods. Breast cancer risk prediction has evolved immensely over the last 10 years, establishing mammographic density and low penetrance genetic markers along with already known high penetrance markers. So far about 100 genetic variants, which are common in a population, have been validated, some of which interact with characteristics of the tumour or mammographic density, implying a relevant impact on diagnostics by the means of sensitivity, specificity, and predictive values. The development of imaging methods in fusion machines enables the personalised combination of several imaging methods. Whilst additional imaging methods in a diagnostic unit of symptomatic patients seems already feasible, the maintenance of a high specificity is the main goal in the screening setting. Molecular markers will help to identify the right imaging method for the individual patient.

14:00 - 15:30 **Studio 2015**

SY 3
Advantages of 3D and hybrid technologies in mammography

Moderator:
R.M. Mann; Nijmegen/NL

Routine use of digital breast tomosynthesis (DBT) for the assessment of screen-detected cases
S.H. Heywang-Köbrunner; *Munich/DE*

Due to the detection of a high percentage of early lesions screening assessment proves a demanding task. Since January 2012, after finishing a comparative study, and based on the allowance by radiation protection, DBT has been applied for routine assessment of screen-detected abnormalities. Based on approximately 1000 consecutive assessment cases we analysed the use and reliability of DBT in routine assessment and the remaining need for additional views. Examples of present limitations and of the special advantages of DBT are shown. DBT proves most valuable for evaluation of abnormalities seen on one view only, since it helps targeting further work-up (ultrasound, further views or percutaneous biopsy) in the correct location. Furthermore, it usually allows excellent distinction of superimposition from a true mass, an architectural distortion or an asymmetry. It may be helpful identifying the fatty hilum in a suspected lymph node and assessing a lesion partly covered by dense tissue. With the present technique assessment of margin sharpness of masses and of morphology and distribution of microcalcifications is still superior on magnification views. Dosages for standard assessment with versus without DBT will be discussed. The potential of correctly used DBT concerns the reduced need for supplementary views, reduced recommendations for short-term follow-up and stereotactic breast biopsy.
Learning Objectives:
1. To understand possibilities and limitations of using DBT for screening assessment.
2. To learn about the additional information that may be expected from DBT and possible pitfalls depending on the indication.
3. To consider potentials of DBT for decreasing radiation dosage associated with screening assessment.

Requirements for digital reading in breast care: a report from the practice
K. Ridder; *Dortmund/DE*

Reading in Breast Care is more than ever before a matter of multimodality reading, with large data volumes and high throughput, especially in screening. This means high performance requirements for both the radiologist and the workplace. Dealing with different reading workplaces for different modalities with different user interfaces results in cumbersome procedures, difficult image comparisons and inefficient workflows. This leads to time-consuming reading and in the worst case to a loss of information. Additionally, new technologies like digital breast tomosynthesis require new methods for fast and efficient reading. An approach to address the challenges of today´s multimodality reading in mammography is accessing and handling different image types on one and the same workplace. An open and scalable client-server application for breast care includes MRI, ultrasound, mammography and tomosynthesis reading with a common user interface and comprehensive tools across all modalities. Customisable layouts and configurable workflows allow for standardised reading and comparison with priors, especially in screening. Integrated BIRADs protocols and detailed CAD information enable a large number of examinations with a short reading time. Simultaneous reading requirements from different locations such as a tumour board office can be better addressed with a server-client approach. In my presentation, I will use the example of syngo.via Breast Care to discuss what a digital image reading system has to perform and will illustrate it with clinical examples from the daily routine.
Learning Objectives:
1. To understand the challenges of multimodality breast diagnostics.
2. To learn about approaches to optimize mammo reading and diagnostics.
3. To discuss requirements for future developments of imaging systems.

Experiences with a breast ultrasound - tomosynthesis hybrid
M. Golatta; *Heidelberg/DE*

The introduction of digital mammography throughout the last years has had a large impact on breast imaging. The digital imaging allows editing of the data and through that analysing processed images. Digital breast tomosynthesis is one method that has been developed. Multiple low-dose images are obtained from predefined angles under compression and are digitally edited and reconstructed as a 3D-image of a breast. The reconstructed 3D-image

overcomes the weakness of standard mammography and enables to reduce false-positive findings as results of overlapping tissue. On the other hand, it enables to reduce the false-negative findings in women with dense breast tissue. Dense breast tissue is a known limitation to the sensitivity of standard mammography. Studies have shown that combing ultrasound with mammography in screening settings can significantly improve the rate of found lesions. First approaches of combing standard mammography with automated ultrasound in one device were reported 15 years ago. The benefits in breast cancer imaging using automated ultrasound and digital mammography/tomosynthesis either in two separate devices or as a combined proto-type have been assessed to some degree. Proto-types have been developed with the attempt of simultaneously obtaining tomosynthesis and automated breast volume scanning by ultrasound to improve screening for breast cancer by comparing two 3D-images obtained under the same compression. With this study we are planning to present first results with a proto-type system combining tomosynthesis with ABVS to assess the benefits of this combination.

16:00 - 17:00 **Studio 2015**

SY 4

The dense breast - a challenge: multimodality breast image reading and discussion of clinical cases

Moderator:
C. Van Ongeval; Leuven/BE

MRI perspective
E. Wenkel; *Erlangen/DE*

The expression “dense breast” is determined on mammography. The mammographic breast density is reflected by the amount of fibroglandular tissue of the breast. The higher the percentage of fibroglandular tissue the less sensitive becomes the mammogram for detecting breast cancer because cancer can be masked by dense tissue. As breast density is an established predictor of breast cancer risk additional imaging techniques like ultrasound, tomosynthesis and MRI are discussed to increase sensitivity. Breast density is dependent on the age and the hormonal status of the women. Mammographically dense breast tissue is not reflected in the same way in breast MRI. Difficult interpretation of breast MRI due to hormonally stimulated breast tissue does not necessarily correspond to mammographically dense breasts and vice versa. Mammographic breast density does not correlate with the background ground enhancement of normal breast tissue on MRI. Studies showed that MRI detects more breast cancers compared to mammography especially in younger women with hereditary breast cancer and dense breast tissue.
Learning Objectives:
1. To learn the indication of MRI with respect to mammographic breast density.
2. To learn the presentation of normal breast tissue in mammographically dense breasts compared to MRI.
3. To show the differences of dense breasts in mammography and MRI.

Tomo/mammo perspective
M. Bernathova; *Vienna/AT*

Up to 30% of cancers in screening programs are not detected by the standard digital mammography (DM). In 52-76% of all cases, cancers are missed in very dense breast tissue. Due to the superimposition of different anatomical patterns, a lesion might not become visible because the tissue above or underneath may mask it. Furthermore, the superimposition of normal structures in the breast may mimic a lesion. Digital Breast Tomosynthesis (DBT) as a three-dimensional radiographic technique is expected to decrease the superimposition effect by reducing tissue overlap and making lesions more conspicuous. DBT is proven to detect smaller cancers earlier, thus increasing the detection rate significantly, as well as reducing the number of false-positive diagnoses and recall rates. For BIRADS 3 lesions, DBT can result in a better classification of the abnormality; for BIRADS 5 lesions, a better definition of the tumour size and multi-focality can be realised. The use of DBT may eliminate the spot compressions, magnification views and further projections in the diagnostic set-up. We will discuss clinical cases where DBT improved the detection of additional cancers not seen on DM. Furthermore we will evaluate tomosynthesis as a complementary technique for the evaluation of lesions detected on DM, especially in breast density ACR Grade 2-4. We will also demonstrate why some lesions can be hidden in very dense breasts (ACR pattern 4) even for DBT. And last but not least, it has to be discussed whether in some cases additional breast ultrasound or breast MRI can be avoided.

Learning Objectives:
1. To learn about advantages and disadvantages of the different imaging methods in the imaging of dense breast.
2. To show complementary DBT in the diagnosis of breast lesions.
3. To understand the impact of DBT on the diagnostic work out.

12:30 - 13:30 **Room G**

SY 5

EURATOM: what is the return on compliance?

Moderator:
J.E. Wildberger; Maastricht/NL

Quality improvements: reducing variation and dose through dose management tools
S.T. Schindera; *Basle/CH*

Efficiency improvements: utilisation tracking through dose management tools
M. Das; *Maastricht/NL*

12:30 - 13:30 **Room M**

SY 6

Present and future of UltraFast™ ultrasound imaging: the revolution moves on

Moderator:
C.F. Dietrich; Bad Mergentheim/DE

Integration of ShearWave™ elastography to conventional ultrasound imaging in light of the EFSUMB recommendations
C.F. Dietrich; *Bad Mergentheim/DE*

The benefits of using UltraFast™ ultrasound imaging in paediatric patients
S. Franchi-Abella; *Le Kremlin-Bicêtre/FR*

ShearWave™ elastography is accurate in identifying prostate cancer
G. Salomon; *Hamburg/DE*

Future applications of UltraFast™ ultrasound imaging: towards functional ultrasound
M. Tanter; *Paris/FR*

Thursday, March 5

12:30 - 13:30 **Room F2**

SY 7

Innovative choices in cardiovascular imaging

Moderator:
J.E. Wildberger; Maastricht/NL

Great vessels
J.E. Wildberger; *Maastricht/NL*

Peripherals
T. Leiner; *Utrecht/NL*

Heart
M. Gutberlet; *Leipzig/DE*

12:30 - 13:30 **Room E1**

SY 8

Evolving needs in CT imaging: a patient-centred approach

Moderator:
L. Bonomo; Rome/IT

Advanced CT technology: how to minimise patient dose
T. Henzler; *Mannheim/DE*

Standardisation of scanning protocols and patient diversity: oil and water?
M. Prokop; *Nijmegen/NL*

Tailoring CT scans to individual patients: design and validation
A. Vanzulli; *Segrate/IT*

12:30 - 13:30 **Room K**

SY 9

Advances of MR and PET/MR in oncology: imagine what MR can be

Moderator:
L.W. Turnbull; Hull/UK

The vision of GE of MRI in oncology
I. Panagiotelis; *Waukesha, WI/US*

New improvements in abdominal and pelvic oncologic MRI
M. Zins; *Paris/FR*

Technical and diagnostic experiences in simultaneous TOF-PET/MRI
P. Veit-Haibach; *Zurich/CH*

12:30 - 13:30 **Room M**

SY 10

Leading with MAGNETOM

Programme not available by date of publication

12:30 - 13:30 **Studio 2015**

SY 11

Driving innovations in ultrasound

Moderator:
A. Nilsson; Uppsala/SE

Improved workflow by using CEUS and image fusion in detection, treatment and follow up of liver lesions
D.-A. Clevert; *Munich/DE*

Acoustic Radiation Force Impulse (ARFI) ultrasound and its clinical advantages in the liver and pancreas
M. D'Onofrio; *Verona/IT*

The clinical benefits of strain imaging in the breast ultrasound
C.S. Balleyguier; *Villejuif/FR*

12:30 - 13:30 **Room G**

SY 12

Better outcomes from detection to treatment

Moderator:
C. Roy; Strasbourg/FR

Advanced ultrasound applications for multidisciplinary use
T. Fischer; *Berlin/DE*

Elastography: improved detection and characterisation
V. Cantisani; *Rome/IT*

Advancements in ultrasound guided biopsy and treatment
J. Garnon; *Strasbourg/FR*

Friday, March 6

12:30 - 13:30 **Room F2**

SY 13

Synergies in CT for better patient care

Moderator:
M. Lell; Erlangen/DE

Programme not available by date of publication

12:30 - 13:30 **Room E1**

SY 14

Moderator:
L. Martí-Bonmatí; Valencia/ES

Diagnosis and early detection of pancreatic cancer: current and future perspectives
R. Manfredi; *Verona/IT*

MRI in prostate cancer management: an evolving role
A. Oto; *Chicago, IL/US*

Breast cancer screening: who, when and how
C.K. Kuhl; *Aachen/DE*

12:30 - 13:30 **Room K**

SY 15

Breast imaging innovation for better patient care

Moderator:
L. Katz; Buc/FR

Breast tomosynthesis experience after 40,000+ examinations
L. Levy; *Paris/FR*

CESM: from initial research to daily clinical routine
M. Lobbes; *Maastricht/NL*

Breast MR: when, why and how
L.W. Turnbull; *Hull/UK*

12:30 - 13:30 **Room G**

SY 16

Guidelines and practice in diagnostic and interventional radiology: follow the lines!

Moderator:
T.C. Lauenstein; Essen/DE

Assessment of high-grade glioma with RANO-criteria: can advanced MRI imaging techniques help?
A. Radbruch; *Heidelberg/DE*

The radiological assessment of high-grade glioma with magnetic resonance imaging is traditionally based on contrast-enhanced T1-weighted images. Limitation of this approach is that contrast-enhanced T1-weighted images visualise exclusively contrast agent extravasation that is caused by a disruption of the blood-brain barrier. According to the Radiology Assessment of Neuro-Oncology (RANO) criteria that were introduced in 2010, also T2-weighted images have to be taken into account to identify infiltrative tumour progression. However, RANO criteria are supposed to be working in progress and important questions such as the identification of pseudoprogression and pseudoresponse remain unsolved. The reliable assessment of these radiological phenomena is not only crucial for the individual diagnosis but also for the correct assessment in clinical studies. This lecture will highlight the potential role of advanced imaging techniques to solve the remaining challenges in neuro-oncologic response assessment.

Best practice in MDCT: how to optimise the radiation reduction and iodine use?
D. Caramella; *Pisa/IT*

New technological developments and regulatory constraints reshape the routine MDCT practice. In the last decades there has been a significant growth of the number of radiological examinations, resulting in an increase of radiation dose per capita. Multidetector computed tomography (MDCT) nowadays makes the largest contribution amongst X-ray imaging techniques to the collective dose of a population. Data from literature indicate that multiple imaging procedures are frequently performed, with patients receiving CT scans corresponding to an effective cumulative dose of tens of mSv. For this reason, it is important to reduce the radiation dose given to patients in every MDCT examination without impairing its diagnostic quality, following the strict guidelines contained in the new European Directive 2013/59/EURATOM of 5 December 2013, that gives challenging targets to all stakeholders in terms of justification, optimisation and patient information. Recently, iterative reconstruction has introduced relevant changes in the practice of MDCT. In comparison with the conventional filtered back projection techniques, using iterative reconstruction the number of projection views can be significantly reduced without sacrificing image quality. Therefore, iterative reconstruction algorithms have significant potential to reduce radiation dose in MDCT. These technological advancements have also the advantage of allowing optimisation of the use of iodinated contrast medium, permitting to obtain better enhancement with lower doses, provided that best practices are in use and are systematically checked.

Barcelona-clinic liver cancer guidelines: cTACE positioning within the guidelines
T.C. Lauenstein; *Essen/DE*

The incidence of hepatocellular carcinoma (HCC) is increasing worldwide during the last decades. Diagnosis and therapy of HCC are based on an interdisciplinary approach, where hepatologists, oncologists, surgeons and radiologists are involved. Thus, it is important to rely on a general algorithm for the treatment of HCC depending on the tumour load and the severity of underlying liver disease. The Barcelona Clinic Liver Cancer (BCLC) staging system distinguishes five stages with progressively worse prognosis and has been validated by several studies. In patients who are not eligible for curative resection or liver transplantation but still have disease confined to the liver, locoregional therapies play an important role in reducing tumour burden, providing palliation of symptoms and improving survival. Transarterial chemoembolisation (TACE) represents the standard of care for intermediate stage BCLC (B). Furthermore, TACE is used as a bridging and down-staging therapy option. Different aspects of TACE within the confines of the BCLC are discussed in this presentation. First and foremost, the technique of TACE as well as data of clinical outcome will be highlighted. Advantages and disadvantages compared to other treatment options, and also the combination with different therapeutic approaches, will be described. Eventually, prognostic factors for therapy response including liver function and tumour load are discussed.

12:30 - 13:30 **Room N**

SY 18

First time right imaging with Philips MRI

Moderator:
E. Jean; Eindhoven/NL

Introduction
E. Jean; *Eindhoven/NL*

Fast and robust neuro imaging with Ingenia 1.5T
J. Savatovsky; *Paris/FR*

Advanced MRI and visualisation in oncology
E.M. Pedersen; *Aarhus/DK*

Questions and answers

12:30 - 13:30 **Room M**

SY 19

New premium technology of Samsung

Moderator:
J. Sunwoo; Seoul/KR

Introduction of Samsung technology
J. Sunwoo; *Seoul/KR*

Clinical implications of S-Fusion
M.W. Lee; *Seoul/KR*

Clinical values of RS80A ultrasound
N.N.

Questions and answers

12:30 - 13:30 **Room C**

SY 20

New detector technology improves patient safety

Moderator:
A. de Roos; Leiden/NL

Safer imaging – clearer outcomes
J. Hall; *Otawara/JP*

New detector technology in clinical practice
R. Bull; *Bournemouth/UK*

Widening the scope of clinical CT applications
M. Prokop; *Nijmegen/NL*

14:00 - 15:30 **Room M**

Cardiac

SY 21

Multimodal approaches to the perfusion and diffusion assessment: expanding horizons for medical imaging!

Moderator:
I.N. Pronin; Moscow/RU

Cardiac CT and cardiac GSI in assessment of myocardial scars
V.E. Sinitsyn; *Moscow/RU*

Nuclear and hybrid imaging in assessment of myocardial perfusion: state of the art
K.V. Zavadovskiy; *Tomsk/RU*

CT GSI and MRI in assessment of pulmonary perfusion in patients with chronic thromboembolic disease
E.A. Mershina; *Moscow/RU*

Perfusion in PET
D.V. Ryzhkova; *Moscow/RU*

Arterial Spin Labeling (ASL): new horizons in brain perfusion assessment
I.N. Pronin; *Moscow/RU*

14:00 - 15:30 **Room C**

SY 22

Screening with breast tomosynthesis: an emerging reality

Moderator:
P. Skaane; Oslo/NO

The American experience
S.M. Friedewald; *Chicago, IL/US*

The Spanish experience
M. Álvarez-Benito; *Córdoba/ES*

The Italian experience
D. Bernardi; *Trento/IT*

The Norwegian experience
P. Skaane; *Oslo/NO*

Saturday, March 7

12:30 - 13:30 **Room M**

SY 23

Contrast-enhanced ultrasound in the imaging of patients at risk of developing malignant lesions

Moderator:
C. Stroszczynski; Regensburg/DE

The role of CEUS in the detection and diagnosis of liver metastases
M.C. Beermann; *Stockholm/SE*

Surveillance of patients with liver cirrhosis: is there still a role for CEUS?
V. Cantisani; *Rome/IT*

Quantification on DCEUS: new trends and developments
F. Tranquart; *Geneva/CH*

12:30 - 13:30 **Room C**

SY 24

CT and contrast media innovations: a patient-centric approach

Moderator:
N.N.

Clinical experience on cardiovascular imaging with revolution CT
R. Schmitt; *Bad Neustadt An Der Saale/DE*

4D CT imaging: from morphology towards functional assessment
L. Macron; *Saint Denis/FR*

Cardiac CT with isosmolar contrast media: higher comfort, better image?
C. Loewe; *Vienna/AT*

12:30 - 13:30 **Room N**

Breast

SY 25

Early detection of breast cancer and dose reduction for mammography and tomosynthesis

Moderator:
N.N.

Photon counting technology: early detection and dose reduction for mammography and tomosynthesis
J. Rehn; *Solna/SE*

With its high efficiency and low noise, photon counting technology can provide excellent image quality at a very low dose in mammography. The performance has been proven clinically; for instance in a recent study by Weigel *et al.*, where photon-counting mammography had a significantly higher cancer detection rate compared to a comparable patient group screened with conventional technology. At the same time the dose was more than 60% lower. This is made possible by the photon-counting detectors in combination with a scanning geometry with multiple thin detector lines. This configuration provides intrinsic near-perfect scatter rejection and no additional grid is needed. This factor alone can reduce the dose by a third compared to conventional full-area detectors. Application of more than one energy threshold allows for true spectral imaging, where a low- and a high-energy image are acquired in a single shot. This way, additional information can be extracted and different tissue types can be separated. One application is measurement of the volumetric glandularity of the breast, which does not rely on an uncertain physical measurement of the compressed breast thickness. The photon-counting technology and scanning geometry is easily adaptable to breast tomosynthesis. By changing the scanning motion, each detector line is imaging the breast from a different angle thus providing all tomographic projections in a single scan at the same time as for 2D mammography. The low noise, low dose and scatter removal features are preserved. Hence, excellent clinical performance can be expected for a photon-counting tomosynthesis system. In 2012 Wallis et al reported that photon counting tomosynthesis outperforms 2D mammography for readers with the least experience with lower x-ray dose compared to conventional full-area detectors.

Spectral lesion characterisation: initial clinical results
N. Wieberneit; *Hamburg/DE*

Between 2009 and 2013 we screened 68423 women over 50 and recalled 2367 (3.5%). 485 (23%) of these women had solitary well-defined lesions, of which 267 were cysts (4 per 1,000 screens). These recalls cause stress to individuals and a cost to society. Techniques to improve characterisation at screening could reduce recalls. Having previously determined the spectrally resolved x-ray attenuation of cyst fluid and solid lesions on formalin fixed specimens, we aim to establish whether in-vivo solid and cystic lesions can be distinguished using spectral mammography in a pilot clinical study. All women undergoing mammograms as part of their routine diagnostic work-up were consented for analysis of spectral information obtained from regular imaging on a CE marked clinical mammography system (Philips MicroDose Spectral Imaging). Images were anonymized and analyzed retrospectively after diagnosis was confirmed with ultrasound and / or pathology. 144 solitary lesions (71 cysts and 73 solids) were delineated by an expert radiologist with elliptical contours for the lesion and a surrounding reference region. Based on the x-ray attenuation of cyst fluid and solid lesion specimens, a lesion characterisation algorithm modelling local breast height and composition was used to predict the cystic and solid volume fraction of the lesion, which is directly related to the probability of the lesion being cystic or solid. The lesion characterisation tool demonstrates promising results for determining the cystic vs solid nature of lesions on spectral mammography. Our results justify undertaking a larger reader study to refine the algorithm and determine clinically relevant thresholds to allow safe classification of cysts.

Personalised breast care with a spectral breast density measurement
B. Cederström; *Solna/SE*

Photon counting spectral imaging provides high detective quantum efficiency, low dose and material decomposition with spectral breast density measurement as the first clinical application. Breast density is a risk factor for breast cancer and an indicator for the sensitivity of mammography. A breast density measurement could be a starting point for a personalized screening plan with for example tailored screening interval and choice of imaging modality. Dual energy imaging is today a reference for body composition measurements, non-contrast spectral mammography brings this technology to breast imaging with potential improvements in accuracy. We report on our experience with using the Photon counting spectral mammography system in our clinical practice and present data on dose reduction and performance indicators of the image quality and of the spectral breast density measurement.

12:30 - 13:30 **Studio 2015**

SY 26

Widening the spectrum of CT

Moderator:
A. Vlassenbroek; Brussels/BE

Imaging biomarkers in CT: from the idea, through research to clinical innovation
A. Alberich-Bayarri; *Valencia/ES*

CT modality has suffered a tremendous revolution in the last decade. The enormous progress made in fields such as IMR or spectral CT has opened a new window to the applications of CT. Despite of this evolution, the current added values of CT are mainly related to the adequate processing of all the data they generate. 3D methods and advanced post-processing software have been integrated in workstations and client-server infrastructures to provide quantitative measurements that aid in the diagnosis or the evaluation of treatment effectiveness in patients. However, imaging biomarkers standardisation is still a challenge with a need for consensus. Although important efforts are being done by scientific societies in the definition of the structured reporting architecture, the progresses in the field of quantitative imaging have not been accompanied by a change of paradigm in reports. Therefore, there is a need for the establishment of workflows for the development and implementation of structured reports for CT imaging

biomarkers. In order to implement a complete methodology for the quantification of a biological or physiological property, all the steps in the imaging biomarkers implementation workflow must be carefully addressed. The post-processing platforms and PACS existing nowadays allow for the extraction of some imaging biomarkers but lack in the adequate storage of all the information in databases for scientific exploitation. The integration of imaging biomarkers working in multidisciplinary teams of radiology and engineering taking into account all the steps of the workflow will have an enormous impact in the upcoming advances of CT.

Iterative model reconstruction (IMR) in routine clinical use
C. Yeong; *Warrington/UK*

Indications for CT scans and frequency of repeat scans have been increasing. This has contributed to a significant increase in the exposure of radiation to the general population. Knowledge based iterative reconstruction promises to be a major significant leap forward in dose reduction. In Warrington, we have been scanning with IMR for the past 12 months. In CT brain, using IMR, we average CTDI = 20mGy, DLP = 400mGy cm. This is a reduction of 40 - 50% of the typical doses in most hospitals[1]. In CT of the thorax, the average in many dose surveys is CTDI of 11mGy. With IMR, the average CTDI is 3mGy. In High resolution lung scans (HRCT), the degree of dose reduction is less significant. In CT of the abdomen & pelvis, the low noise images allow much better density appreciation of soft tissue structures. Average UK doses are CTDI=13 mGy cm, DLP=700 mGy cm, with IMR, our average doses are CTDI=4 mGy cm, DLP=300 mGy cm. IMR is particularly useful for obese patients, as noise is very well suppressed. Enhancement of soft tissue structures with iodinated contrast is more easily appreciated. We routinely scan with 100kV for patients up to 85kg. This results in greater soft tissue enhancement post-contrast. With CT colon, our routine protocol is for an ultra -low dose prone scan followed by a low supine scan to view extra-colonic structures. With IMR, the total for both scans is DLP=170mGy (about 2.5 mSv). In CT angiography, the low noise images allow us to exploit the k-edge of iodine by using 80 kV in CT pulmonary angiography allowing lower contrast volume and flow rates to be used. Body angiography is performed with 100kV, in patients up to 130kg, with overall dose reduction of >60%
Learning Objectives:
1. To learn about the strengths of using IMR in various anatomical areas and different clinical scenarios are discussed.
2. To learn about the disadvantages and limitations of IMR in daily practice, illustrating the degree of dose reduction versus image quality that is achieved in routine use.
3. To become familiar with the routine use of IMR in a busy district hospital and whether there is any impact to work-flow.

Innovations in routine spectral CT
N.N.