Results: The system was evaluated with 119 new images. The results were satisfactory for the four resolutions tested. The accuracy achieved for the resolutions of 64x64, 128x128, 256x256, and 512x512 pixels were 0.74, 0.98, 0.98 and 1, respectively. Since the required computational capacity increases considerably with image size, the optimal resolution might be between 64 and 128 pixels, depending on the available computational resources and accuracy requirements. Most of the misclassifications have been false negatives, i.e., the NET1 type images have been classified as NEC type.
Conclusion: We have demonstrated that a diagnosis algorithm based on DL has been effective in discriminating between NET and NEC with results similar to those of the pathologist. Our software can be adapted to integrate more than one ANN and therefore, this opens a range of possibilities to combine DL and histological diagnosis. A further goal is to be able to classify not only a NET but the three-tier system (NET1, NET2 and NET3) attending exclusively to the tissue differentiation information.

PS-02-002
Digital analysis of well-differentiated hepatocellular carcinoma
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Background & objectives: The diagnosis of well-differentiated hepatocellular carcinoma (WDHCC) can be challenging. In this study, we performed digital analysis of well-differentiated hepatocellular carcinoma by using the software QuPath to see whether some parameters may be helpful for the diagnosis of WDHCC.
Methods: We queried our records for the biopsies of WDHCC from 2018 to 2022. Thirty cases were included. Nineteen cases had adjacent benign liver parenchyma. Thirteen cases had Ki-67 and CD34 immunostainings. We used QuPath to analyse the nuclear hematoxylin optical density, nucleus/cell area (N/C) ratio, maximum cell calibre, Ki-67 and the percentage of the positive area of CD34 staining.
Results: The nuclear OD was significantly higher, and the tumour cell size was remarkably smaller in WDHCC than in benign hepatocytes (BH). N/C ratio was markedly higher in WDHCC (0.2 ± 0.01) than in BH (0.12 ± 0.003). If N/C ratio cutoff was >0.15, the sensitivity was 89.5% and specificity was 94.7%. Ki-67 index was significantly higher in WDHCC (14.3 ± 6.0%) than in BH (1.3 ± 0.4%). If Ki67 index cutoff was >4%, the sensitivity was 63.6% and specificity was 100%. CD34+ area was significantly higher in WDHCC (15.2 ± 1.8%) than in BH (1.8 ± 0.3%). If CD34+ cutoff was >4%, the sensitivity was 92.3% and specificity was 100%.
Conclusion: Digital analysis may be helpful in assisting the diagnosis of WDHCC. N/C ratio >0.15, Ki-67 proliferation index >4% and CD34 positive area >4% may support the diagnosis of WDHCC.

PS-02-003
Digital analysis of lung cancer whole slide images – part 1 of the INGENIO multicentre ring trial
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Background & objectives: INGENIO is a multicentre project aimed at standardizing digital pathology for routine clinical care. After providing training in digital analysis to pathologists, we conducted a ring trial to evaluate their agreement in the analysis of lung cancer whole slide images (WSI).
Methods: Participants received 4 WSI. They were tasked with obtaining on each WSI the number of non-tumour cells and tumour cells (epithelial and stromal). They used QuPath to annotate tissue, perform cell segmentation, and classify cells. The results were exported and analysed to assess agreement on the number and percentage of cells in each category using the intraclass correlation coefficient (ICC).
Results: Nine centres participated in the ring trial. By visual examination, the annotations made in QuPath by the different pathologists were similar. One WSI mostly contained necrosis, resulting in higher annotation subjectivity for this image among centres. The remaining 3 WSI had differing numbers of epithelial, stromal, and non-tumour cells. Interobserver agreement was moderate for the absolute number of epithelial and stromal cells (ICC 0.73 and 0.75, respectively) and poor for non-tumour cells (ICC 0.06). Regarding percentages, there was moderate agreement for stromal cells (ICC 0.76) and poor agreement for non-tumour and epithelial cells (ICC 0.40 and 0.09, respectively).
Conclusion: Although digital pathology is considered a more objective way to quantify different pathology features, it still has some degree of subjectivity, mostly in the annotation phase. This ring trial demonstrates that with a little training pathologists are able to reach moderate agreement on digital image quantification. However, further training sessions and an additional ring trial with more WSI are planned to better standardize our results, with the ultimate goal being for each centre to analyse their own WSI.
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PS-02-004
Digital pathology implementation in routine breast cancer pathology clinical service: how we made it work and what we gained
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Background & objectives: The use of digital slides shows advantages over microscopy, but validation is needed to allow its use in clinical practice. The aim was to support the quality and advantages of using digital pathology in breast pathology clinical practice.
Methods: Different steps included verifying pre-analytical procedures and validation of interpretation. All pathologists had access to a Digital workstation and microscope. Cases were diagnosed on WSI and confirmed on physical slides before signing out. Comments on diagnostic pitfalls were collected in a list. A total of 217 consecutive breast cancer were included. Ground truth was established on physical slides before MDT.
Results: Primary diagnoses on WSI showed a high average agreement of 99% with final diagnoses. The pathologists using Digital experienced reduced barriers to asking for a second opinion on challenging cases with rare morphology through the live share function. Discussions with peers resulted in a decrease in IHC orders in 20% of cases. The production per pathologist increased between 12-50 % compared to production before the implementation. The interobserver agreement, measured as a reduced number of cases with revised diagnoses at review before MDT, increased from 71 % to 94.4%. The production measured as the number of signed-out cases per pathologist per week increased between two- to three-fold.
Conclusion: The entire group chose to continue using digital pathology in routine practice. In 2022 the group signed out a total of 2017 breast pathology samples using Digital pathology.
Individual training and validation increase confidence in the use of Digital Pathology. This study reports a productivity increase between 2x-3x, reduction of supporting immunostainings, enhanced collaboration with live sharing, and reduced need for revision of diagnoses before MDT.

PS-02-005
Validation of a quantitative image analysis algorithm for HER2 status determination in breast cancer by immunohistochemistry as positive, low or ultra-low
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Background & objectives: Breast carcinoma (BC) treatment relies on HER2 status using immunohistochemistry (IHC) to identify