



VM in Reference Pathology and External Clinical Services

The new Telepathology Concept?



H.P. Sinn

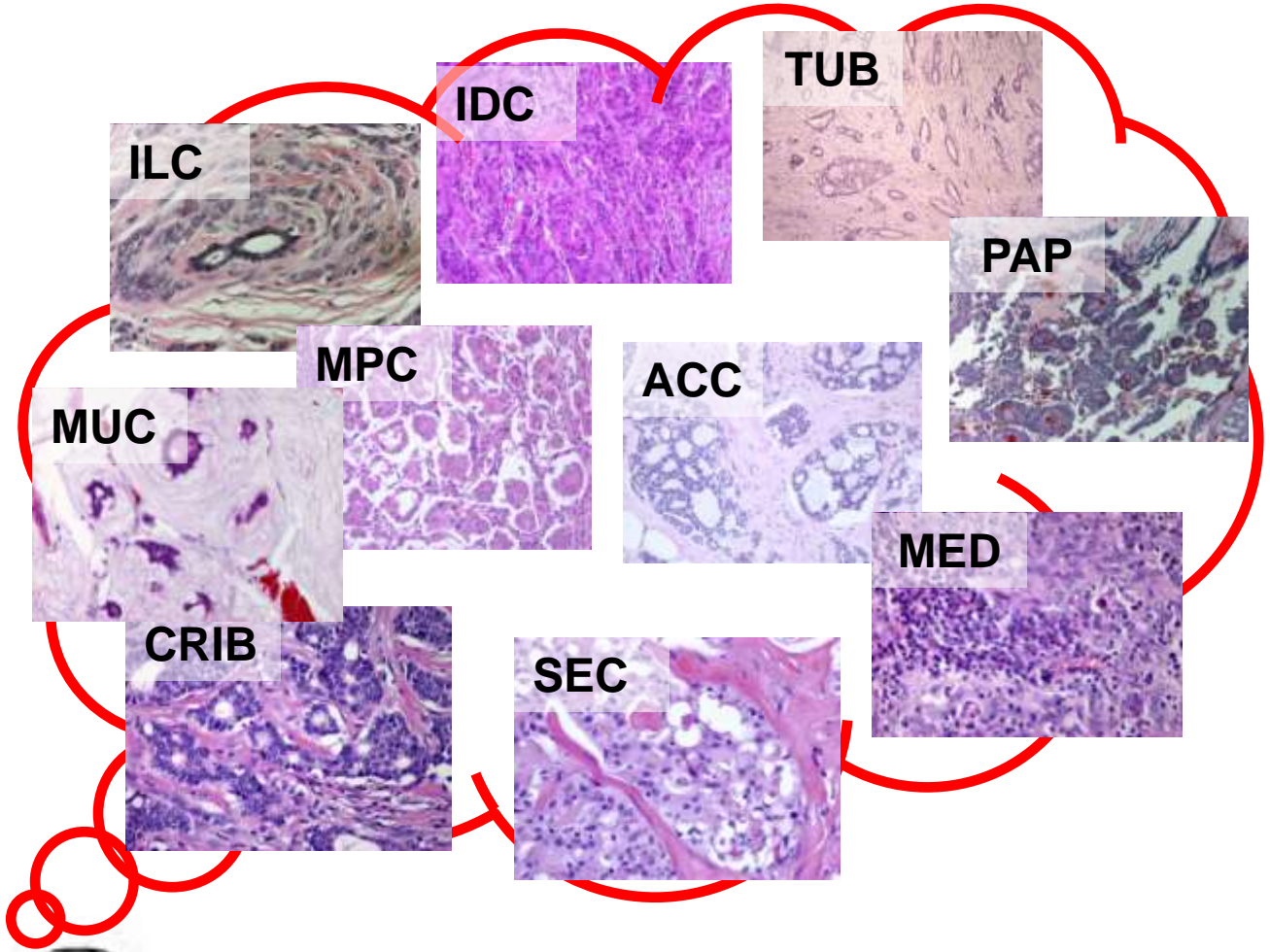
**Sektion Gynäkopathologie
Pathologisches Institut der
Universität Heidelberg**



Disclaimer

Virtual slide usage has been supported by the Medical Faculty, University of Heidelberg

I have no financial or consultative relationship with any commercial entity, nor have I had any in the past.



QA (quality assurance) for breast pathology

- Standardized procedures for work-up, assessment, and documentation (European Guidelines)
- Educational programmes in breast pathology
 - Tutorials in breast pathology, such as offered by the IAP
 - Special courses in pathology of core biopsies
- Quality circles
- Internet based efforts
- Accreditation of the responsible pathologist
- **Double reading**

4 possibly ways for double reading in pathology

- Send away the tissue slides
 - Traditional method of pathologic consulting
- Telepathology
 - Possible, but time consuming and other problems
- Virtual microscopy
 - The future?
- On-site review of pathology slides
 - Not established in Germany

Advantages and disadvantages of sending slides (and/or tissue blocks)

Advantages

- Same conditions for primary and reference pathologist
- Reference pathologist can perform special stains
- Highest possible quality of getting a second opinion in pathology

Disadvantages

- Time delay 1 - 3 days, usually, sometimes longer
- Pathologists cannot interact, little educational value
- Requires a lot of logistic and secretarial effort on both sides
- Slides can get lost

currently the preferred method

Telepathology Solutions

■ Static Telepathology

- Transmission of electronic images (www, ftp, e-mail)
- Disadvantage: Image(s) may not be representative

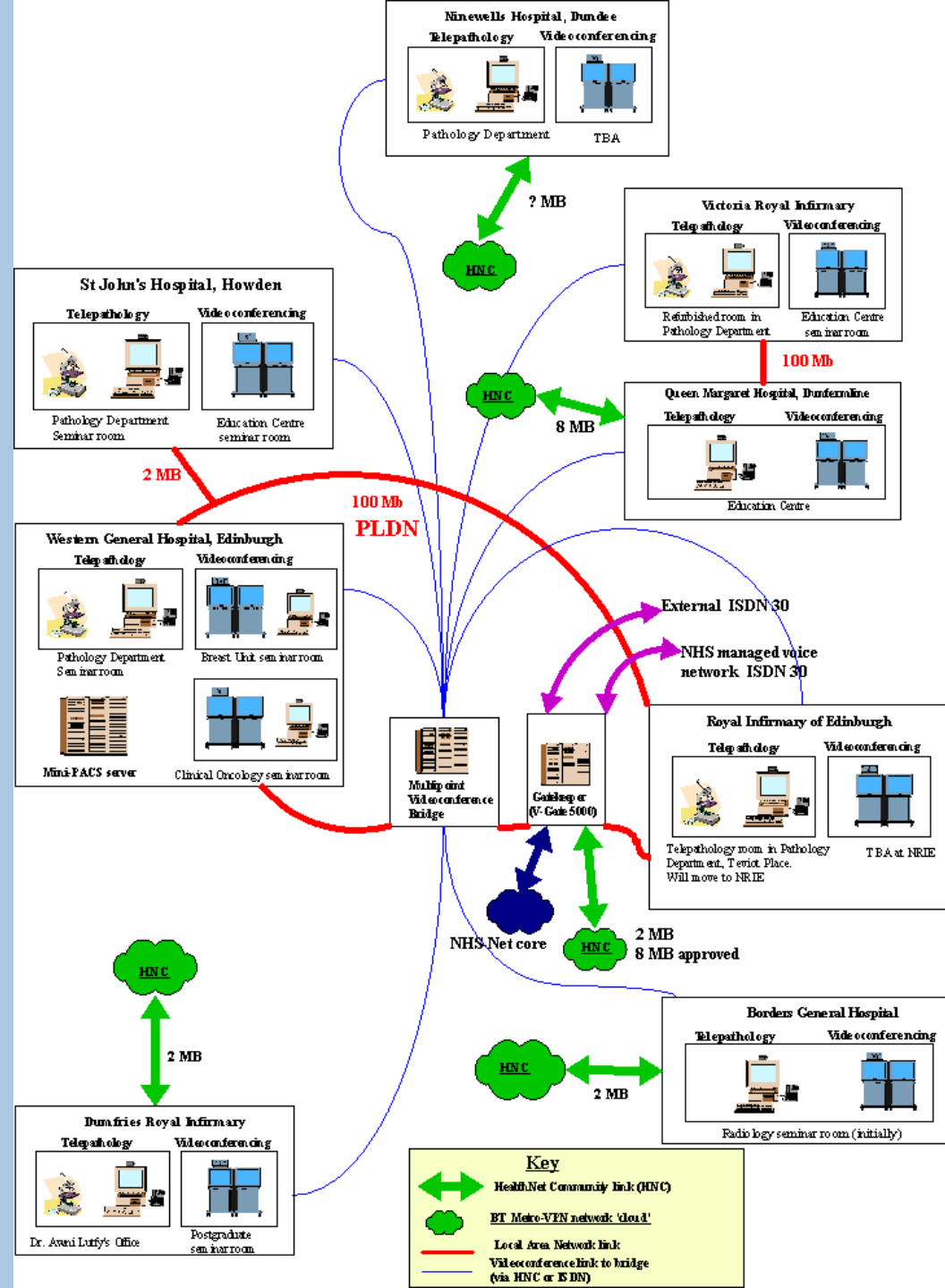
■ Dynamic Telepathology

- „Live“ Microscopy of slides, remote control of microscope
- Disadvantage: Slow, expensive, often malfunction

■ Semi-static Telepathology

■ Virtual Microscopy

Classical Telepathology



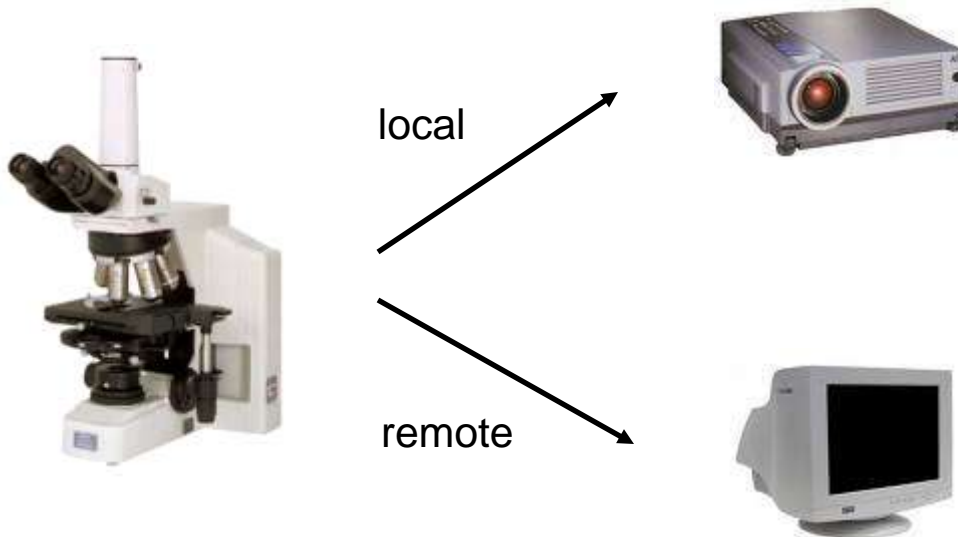
(South Scotland Telepathology Network)

**Damn it, Spock, I am a
doctor, not a computer
programmer**



Telepathology with Mammography Screening Unit Wiesbaden (2002 - 2007)

- Remote viewing of histology slides simultaneous with projection of slides at the conference
 - Live telephone connection
 - About 2 frames / minute
 - Case discussion



Equipment and procedure

■ Wiesbaden

- Mikroscope (Nikon Eclipse)
- 1 Megapixel Camera (Nikon)
- DSL (512 kb/s upload)
- Telephone

■ Heidelberg

- Transmission of case details per FAX from the center
- Viewing with Internet Explorer
- Transmission of reports per FAX to the center



In case of disagreement

- Discussion and arbitrage
- Ordering special studies (immunohistochemistry)
- Sending the slides

Disadvantages of classical telepathology

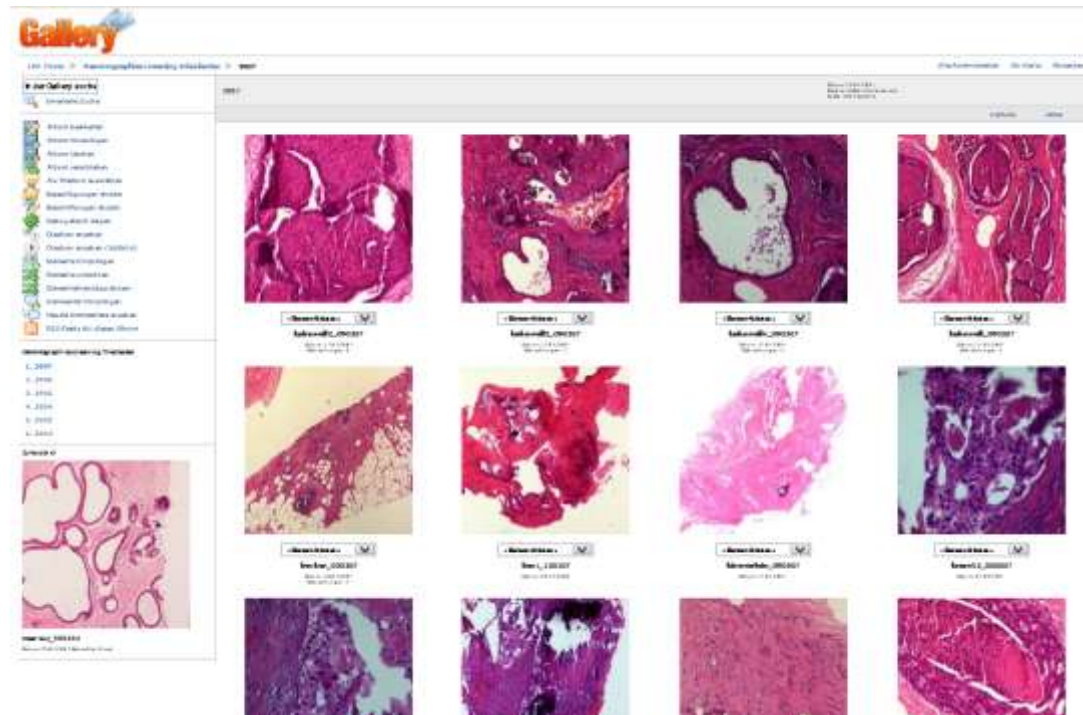
- Only few images at low and at high resolution can be transmitted per case
- Remote pathologist is depends on local pathologist for sending representative fields of view
- Limitations in image resolution and speed of transmission

Experience with telepathology

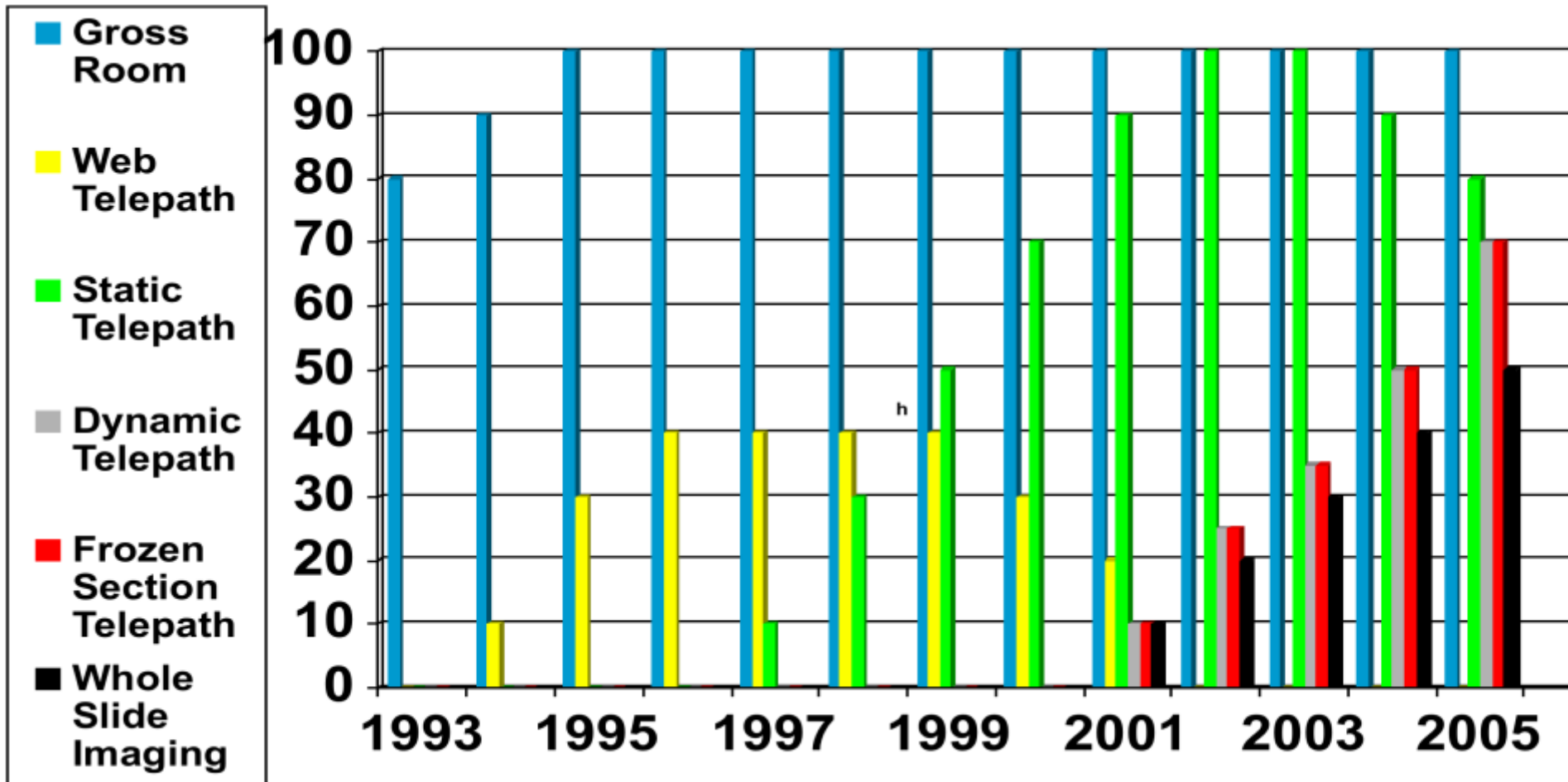
- Routinely used during mammography screening pilot project phase
- Few technical problems relating to
 - Server configuration
 - Network problems
- Very few cases that required sending of the slides (less than 1 case per month)

Additional advantages of telepathology simultaneous with case conference

- Reasoning and discussion among pathologists becomes transparent for all participants
- Histology images can be stored remotely in an image database for
 - education
 - scientific reevaluation
 - case comparisons



Telepathology Volumes at Pittsburgh



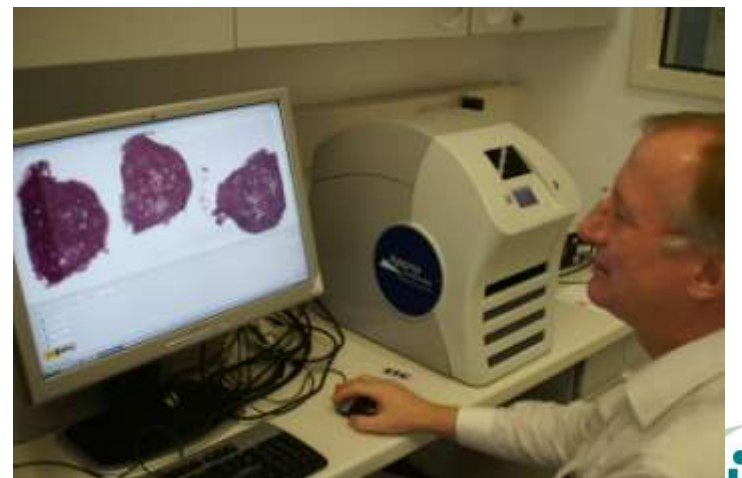


Virtual microscopy for teleconsultation

- Web-based look at microscopy slides, anytime, anywhere
- Quality similar to conventional microscopy
- Immediate access of archived images
- Technology mature

Virtual microscopy for frozen sections

- Clinical Problem: Sentinel node biopsy in remote hospital (Bruchsal)
- Prerequisite: Laboratory with histotechnician and cryostat
- Sampling of the tissue by surgeon (gynaecologist)
- Time needed for cutting of frozen section and scanning: approx. 10 min
- Additionally: Imprint cytology
- In clinical use since 1 year



Virtual microscopy for frozen sections

Possible problems

- Scanning speed: adequate for normal samples, but not for multiple or very large sections
- Network: Outside hospital should have good upload speed
- Quality of tissue sections
- Evaluation more time consuming than under the microscope



Results

- 75 Lymph node biopsies examined
 - 8 Metastases detected
 - False negatives: 1
 - False positives: 0
-

Safe and reliable procedure

Teleconsultation and Quality Circles



Internationale Akademie für Pathologie Deutsche Abteilung e.V.

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45. Symposion 2009

Einladung und Programm

27. Februar - 01. März 2009 in Bonn

Online-Hotelreservierung unter:

www.tcbonn.de/con/html/3341-259.html

[Anmeldung](#) ( pdf-Datei, 37 kB)

[Programm](#) ( pdf-Datei, 1359 kB)

Freitag, 27. Februar 2009

08:30 Uhr - 13:00 Uhr

Halbtags-Schnittseminare:

Lymphome und ausgewählte Differentialdiagnosen

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↓ [Diagnoseliste als .pdf](#)

↓ [Diagnoseliste als .doc](#)

Prof. Dr. med. M.-L. Hansmann, D- Frankfurt

Prof. Dr. med. Ch. Fellbaum, D- Singen

Schwangerschaftsbezogene Trophoblasterkrankungen

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Virtuelle **Mikroskopie**

Virtuelle **Mikroskopie**

Conclusions

- VM for frozen section diagnosis:
 - Useful, if no macroscopic evaluation by pathologist necessary
 - Waiting time (scanning speed) mostly acceptable
 - More time consuming overall
- VM for teleconsultation
 - Advantages:
 - Asynchronous technique
 - Much better imaging compared to classical telepathology
 - Disadvantage: Subjectively “different” than compared with classical microscopy



„I skate to where the puck is going to be, not where it has been.“

Wayne Gretzky

