

Overview of Endoscopy and Laparoscopy

Hideto Yokoi

Department of Medical Informatics

Kagawa University Hospital

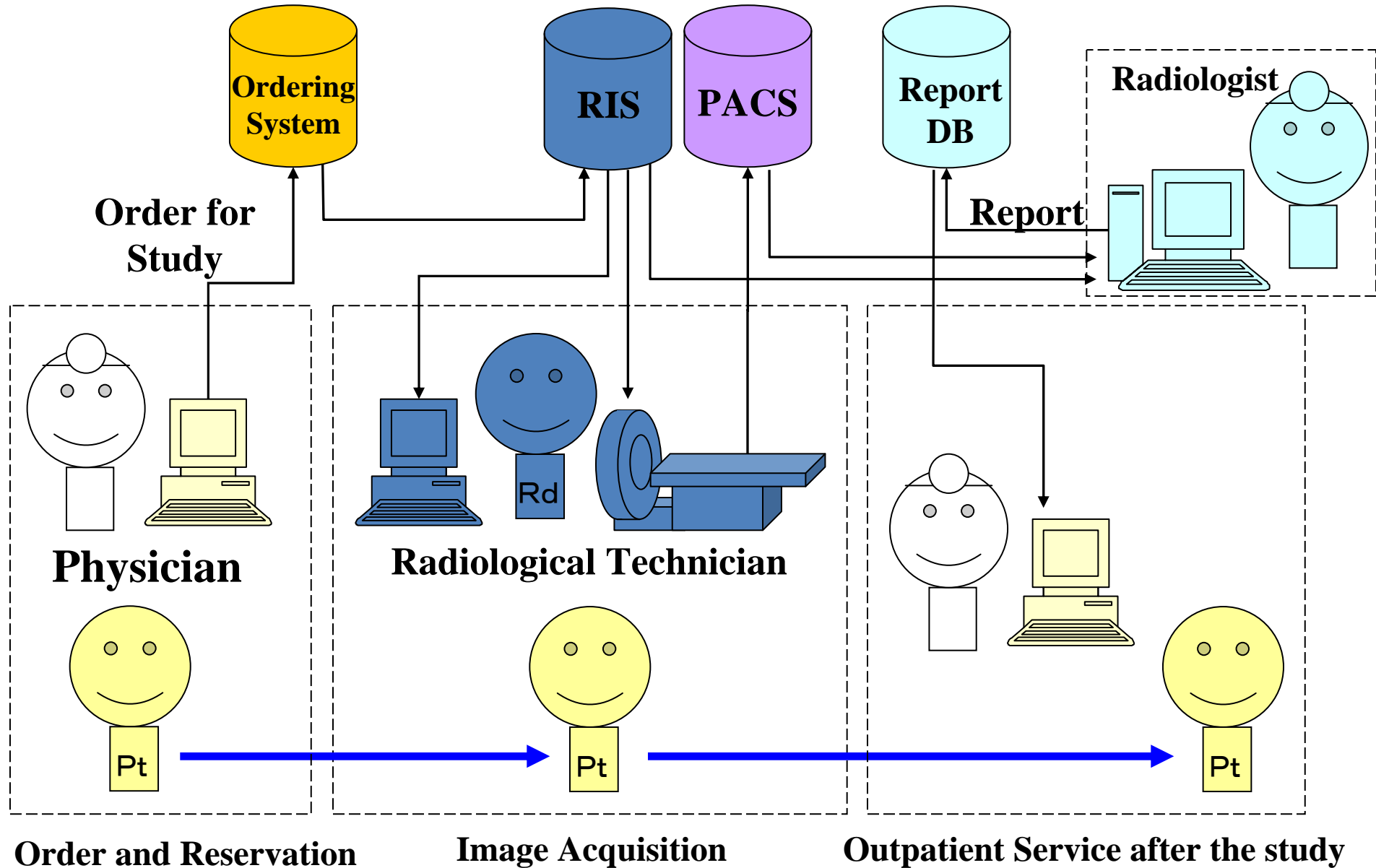
Two types of image interpretation

- Interpretation retrospectively
 - Many of Radiology images
 - Capsule endoscopy
 - Pathology?
- Interpretation based on real time motion picture
 - Flexible Endoscopy, Laparoscopy
 - Ultrasonography
 - Pathology?
 - Some of Radiology images (Cardiac Intervention)
 - Observation modalities of Ophthalmology / Otorhinolaryngology / Gynecology...

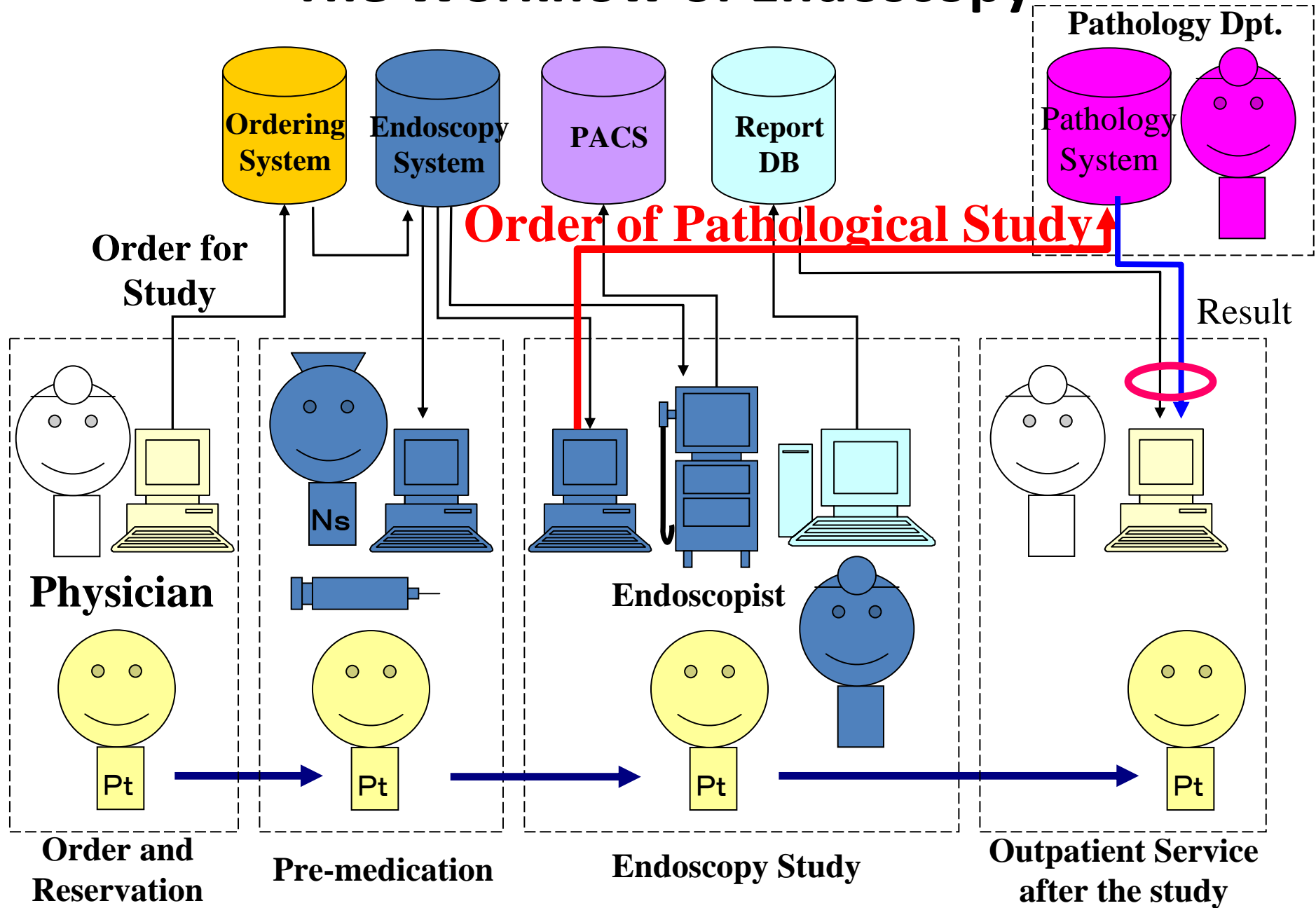
What is “gold standard” in endoscopy diagnosis

- In screening endoscopy, we often perform biopsies.
 - Get specimens from lesion.
 - Pathological study will be performed after biopsy.
 - It is “gold standard” of distinguishing between benign and malignant.

The Workflow of Radiology



The Workflow of Endoscopy

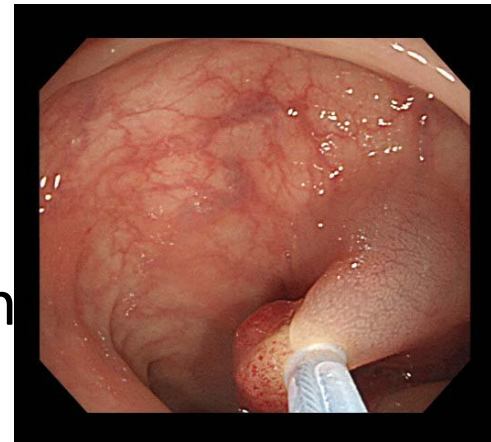


Difference between Endoscopy and Laparoscopy

- The difference depends on
 - presence or absence of “idea of original scene”.
- Endoscopists do not know “original scene” of lumen of GI tracts because they cannot observe the “live lumen” of GI tracts directly with their eyes
 - When we cut and open the tracts, they may not be “live”.
- Surgeons can observe the organs directly at open surgery.
 - Thus, they can discuss the “original scene”.

Difference between Two Gastroenterological Endoscopies

- Flexible endoscopy
 - Endoscopist can observe a lesion with real time image, using some invasive devices.
 - To check an elasticity of a lesion
 - To see a shape change of a lesion, using devices
- Capsule endoscopy
 - Image interpretation is completely retrospective.
 - No elasticity, No shape change
 - Know-how for interpretation is based on flexible endoscopy.



Questionnaire

- Answers from
 - 14 (flexible)Endoscopists,
 - 7 Surgeons,
 - 4 Endoscopy technicians,
 - 7 Nurses,
- Staffs are in Kagawa University Hospital, Koide Hospital, and NTT Takamatsu Clinic in Japan.

About Flexible Endoscopy

(gastroenterological endoscopy, bronchoscopy)

Q1. Does each monitor color seem different ?

- Yes: 24 (Dr. 17)
- No: 8 (Dr. 4)

Q2. If there is difference, does it have effect on diagnosis or procedure ?

- Yes: 5 (Dr. 4)
- No: 19 (Dr. 13)

About Laparoscopy (and Thoracoscopy)

Q3. Does monitor color seem different from what you see in open surgery ?

- Yes: 7 (Dr. 7)
- No: 3 (Dr. 3)

Q4. If there is difference, does it have effect on diagnosis or procedure ?

- Yes: 5 (Dr. 5)
- No: 2 (Dr. 2)

General Impression

Q5. Must we standardize color representation in medicine ?

- Yes: 27 (Dr. 16)
- No: 5 (Dr. 5)

Q6. Which medical procedure do you think color management is needed ?

- funduscope, ultrasonograph
- pathology, photo of operative field

Opinion from Doctors

- Dr. A (Endoscopist)
 - I am nervous about color representation while using NBI (Narrow Band Imaging).
- Dr. B (Surgeon)
 - If there is complete difference of color, it should lead some medical errors (Surgeons distinguish bile duct and blood vessels (artery, vein) by color).
- Dr. C (Surgeon)
 - I agree that each maker has different color of endoscope/laparoscope monitor color.
 - Doctors can adapt the color differences and influence to diagnosis may be small.
 - Resolution is most important rather than color.

Conclusions

- Color management of Endoscopy monitor would be needed.
- At this time, critical accidents occurred depend on color are not recognized clinically.
- Future development of endoscope will lead some needs of color representation (3D system, CAD...)

Thank you very much for your
kind attention.