

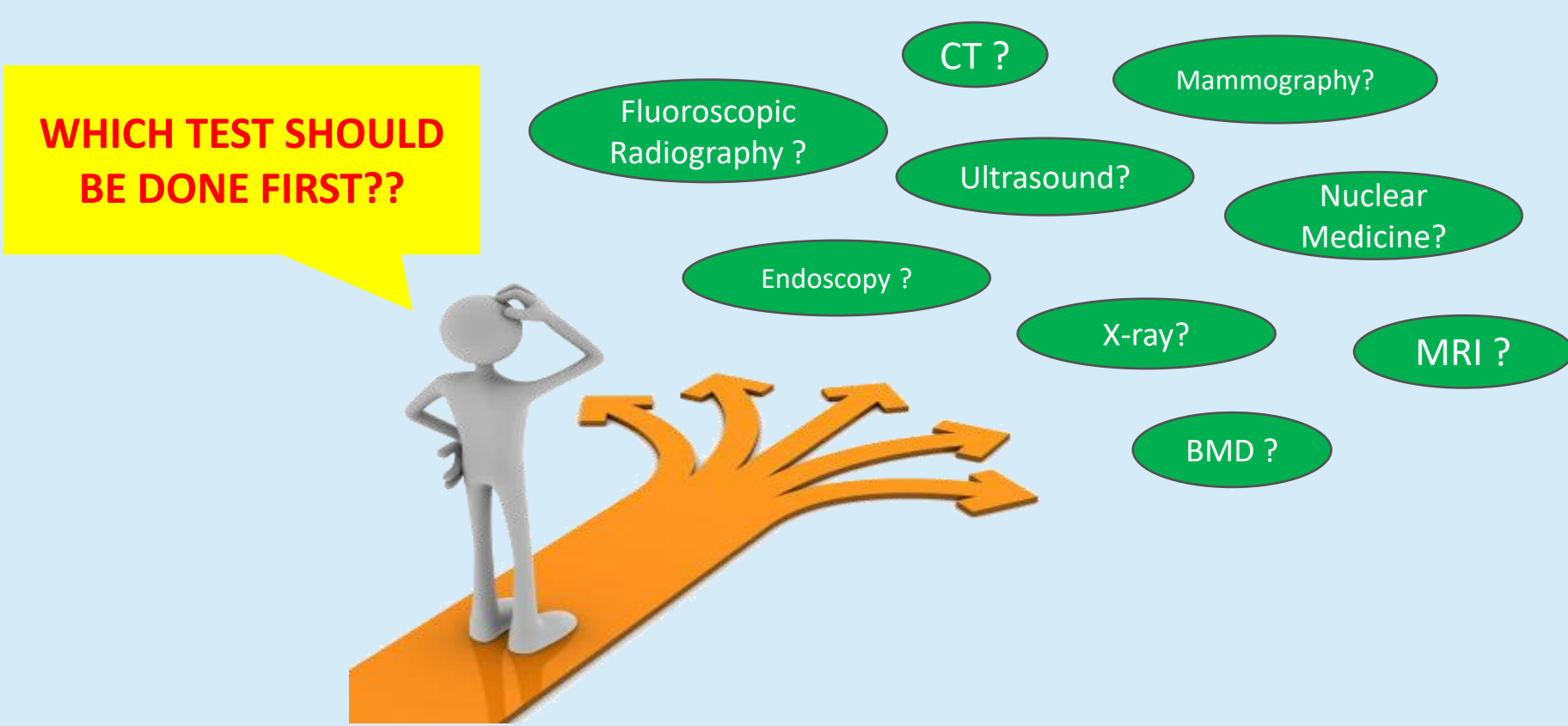
HOW TO IMPROVE ON ERRORS OF EXAMINATION ORDER AS PER PRESCRIPTION

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Introduction

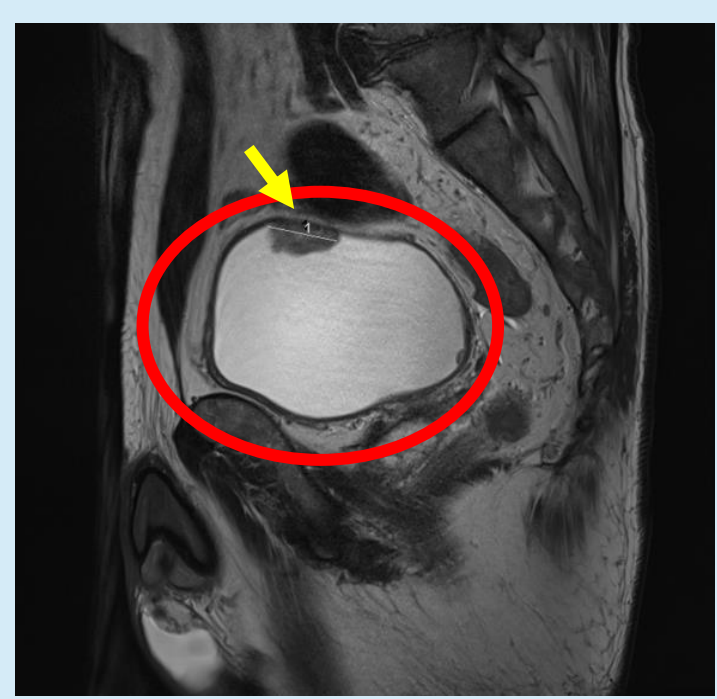
When **multiple tests** are conducted **on the same day**, errors of examination order cause **delay** or **failure**.



Example

CORRECT : MRI Bladder (Bladder Filling) → PET-CT (After Voiding)

[Accurate MRI image]



[Failed MRI image because the order of the test was changed]



Possible for test after **3 hours of waiting (Delay)**
OR
Need for a **re-visit and the re-test (Failure)**

AIM

- TEAM** : Multidisciplinary **TFT** Composition
(Participation of a total of **20** examination rooms)
Radiology Department, Medical IT Team, Nuclear Medicine, Reservation Team, OPD Nursing Team, Endoscopy Team, Electromyography Team, PFT Team, DITI Team, Cardiac Center, SNSB Center, etc.

Measurement index

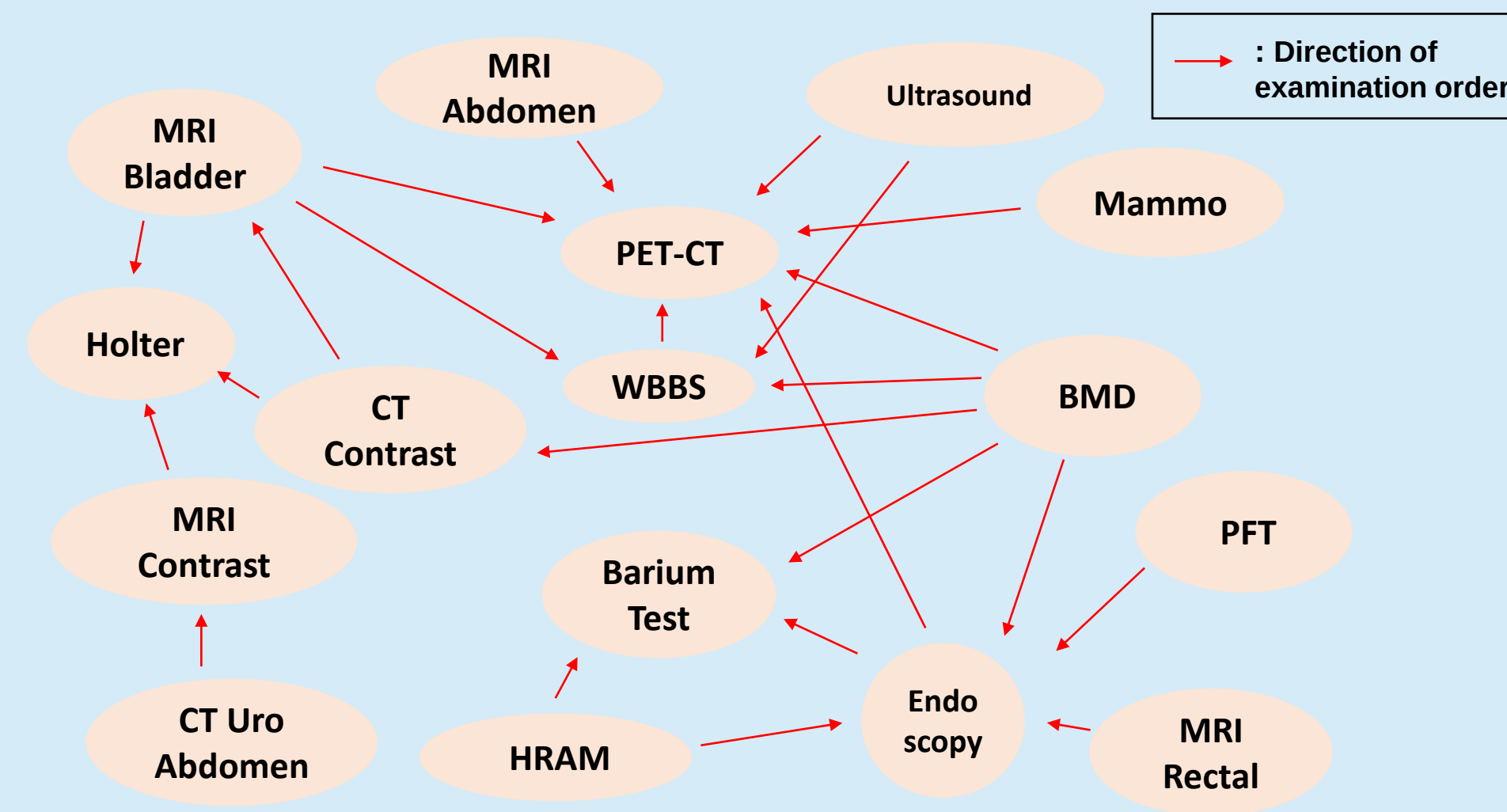
The number of examination order errors(Y-axis)

Objectives : 0 case(Zero)

To establish a HIS(Hospital Information System) that allows for easily accessible, verified, and standardized control of examination order.

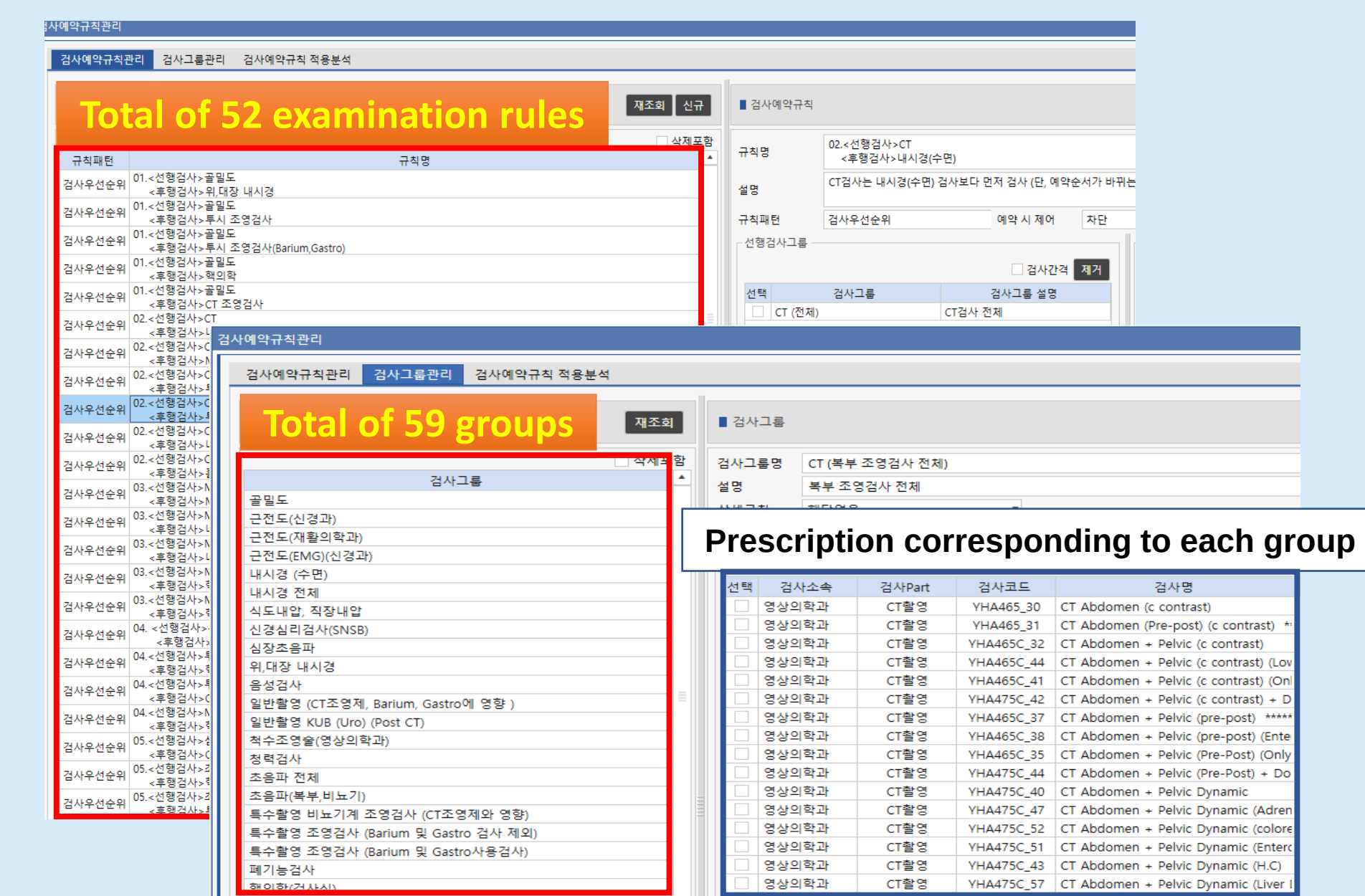
Methods

1. Analysis of every order rules amongst all the examinations



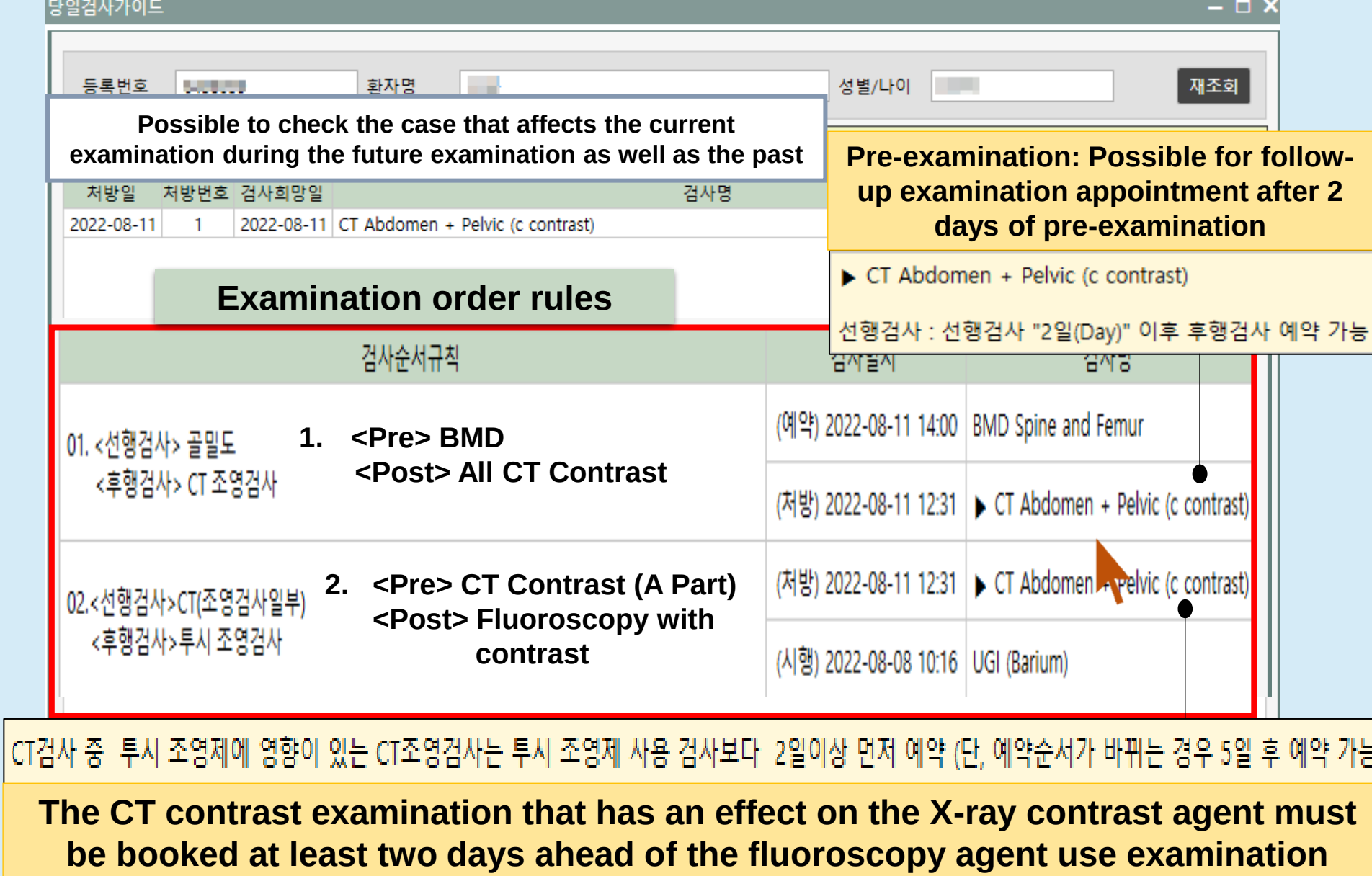
A total of 20 examination teams came together to classify the various examination ordering rules by examination type

3. Development of examination order rules guide system in HIS



5. Application of new examination order rules guide system to HIS

* OPD appointment screen capture is in the following below.

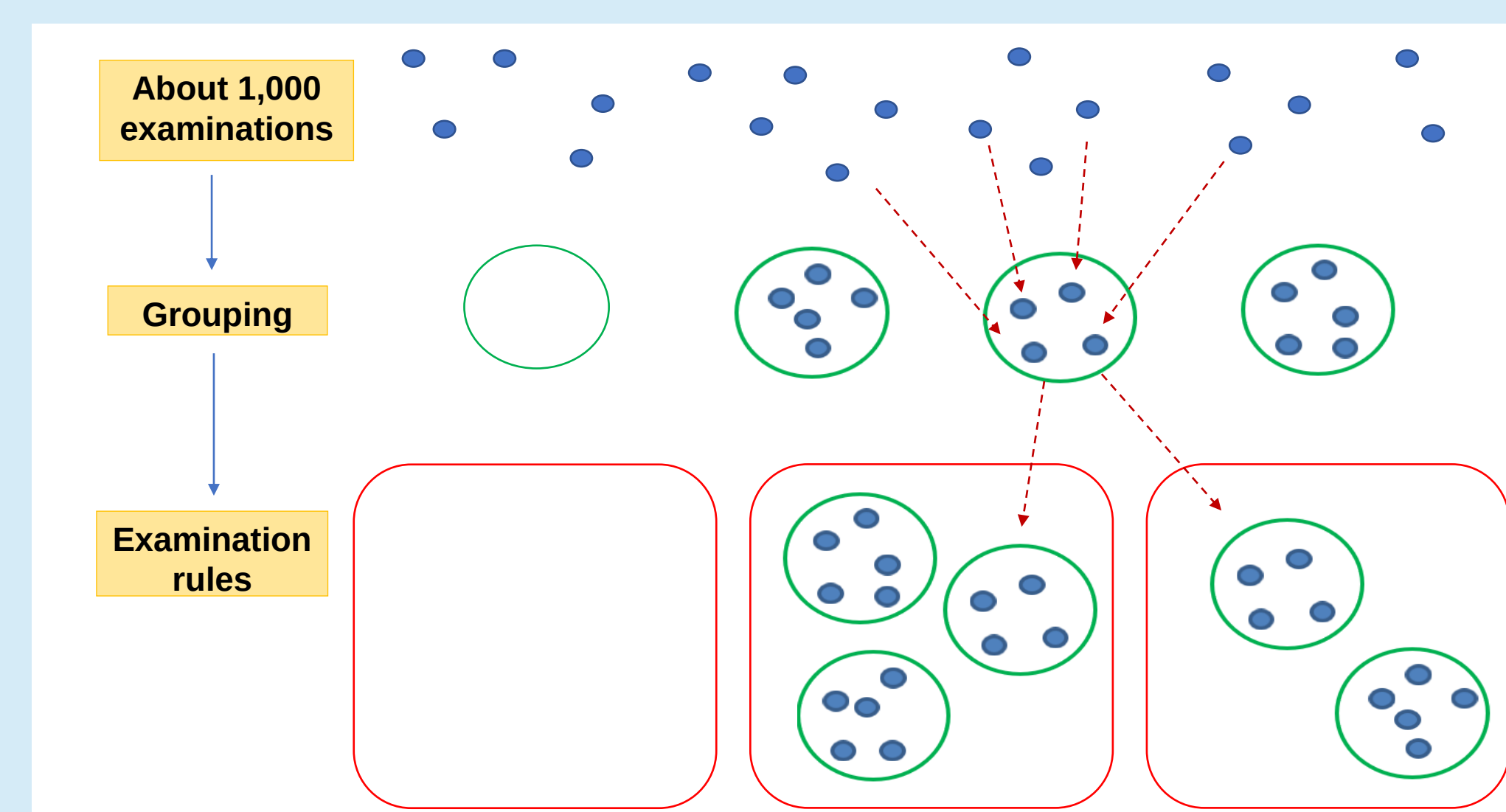


2. Classification by type of examination order rules

- Pattern classification 1. Appointment on the same date unavailable(4ea)
- Pattern classification 2. Appointment on certain time not available(1ea)
- Pattern classification 3. Need for interval of examination period(2ea)
- Pattern classification 4. Pre-examination and post-examination(45ea)

	Pre-examination	Interval between test	Post-examination	Interval in the case of change of test order
1	MRI Rectal	After 3 hours	Colonoscopy	After 4 hours
2	Ultrasound		IVP, DTPA, Hydrogen Breath Test	After 24 hours
3	WBBS		PET-CT	After 3 hours
4	PET-CT	After 2 hours	TMT (Treadmill Test)	Cannot change order
5	Echocardiography	After 20 min	T1-201myocardial-spect(stress-rest)	After 1 day
6	BMD, CT UPPER/LOWER Abdomen, PET-CT, Esophageal Scan		Barium Study, Colonoscopy	Cannot change order
7	MRI Abdomen(NPO)		PET CT	After 4 hours
8	DTPA		CT Contrast	After 2 days
9	VCUG		DTPA	After 2 days

4. Algorithm generation process (Mimetic diagram)



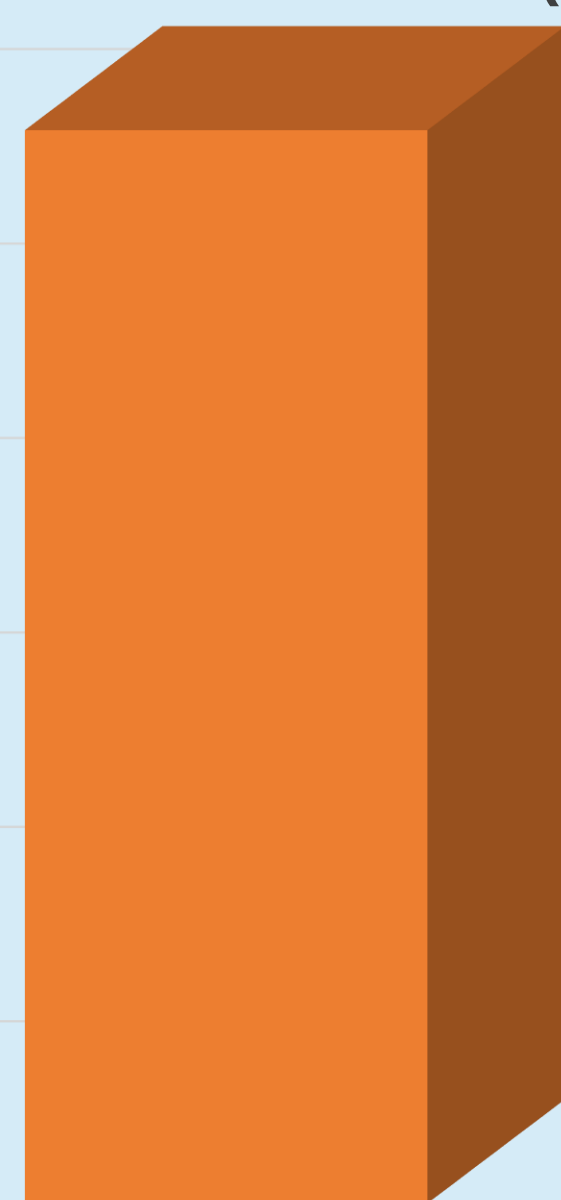
- Grouping of prescriptions: Over 1,000 prescriptions requiring examination ordering were grouped into the same type
- Generation of examination rule patterns: The 59 examination groups were divided into pre-examination and post-examination groups, resulting in 52 examination rule patterns

- If you want an appointment that does not comply with the rules of the examination appointment, an "examination order rule guide" related to the examination appears in the empty space on the screen.
- It provides a detailed description on which examinations should be booked first so that appointments can be made easily and accurately. (Also, it is possible to check the scheduled examination and the previous examination that may affect the order of the examination on the day.)
- If you make a wrong appointment, the caution pop-up window will pop up so that you can check it again.
- It applies not only to the medical department, but also to the reception appointment center and the examination department, enabling final confirmation on errors in the examination order.

RESULTS

[The number of examination order errors]

138 cases(46 cases / month)



Before improvement
(December 2021~February 2022)

0 (ZERO)

After improvement
(June 2021~August 2022)

As a result of comparing the number of errors in each of the 3 months before and after the application of the examination ordering control system, an average of 46 errors per month were completely reduced to zero after the introduction of the new system. This demonstrated the success of the system in eliminating errors.

CONCLUSIONS

Efficiency ↑

- Reduction of working hours related to appointment
- Resolution of the examination delays in the examination room and retests

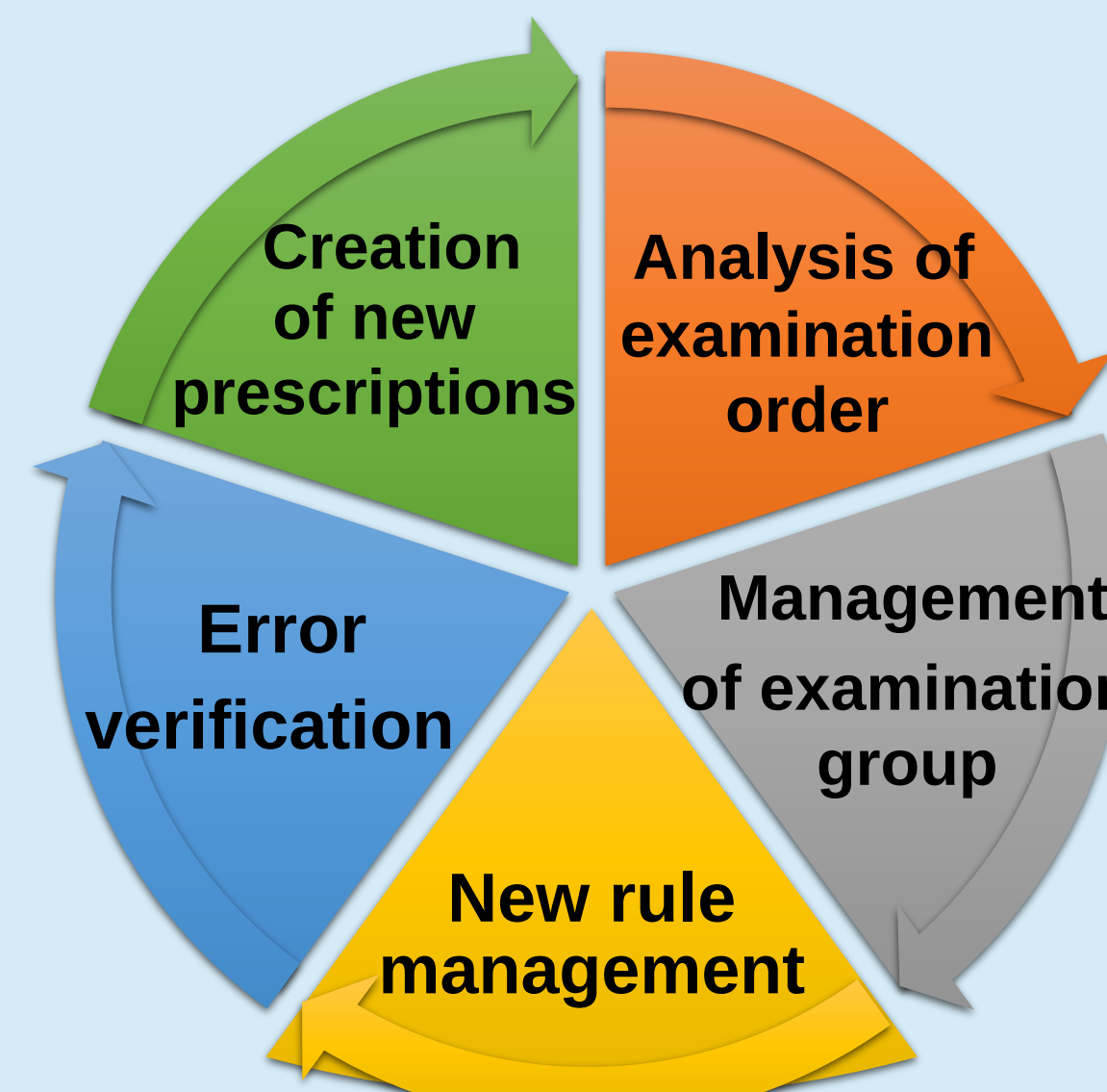
Customer satisfaction

- Improvement of patient experience
- The cornerstone of future AI systems (Utilization of kiosk)

Cooperation

- Provision of systematic examination-specific priority process to each medical department and examination room

Continuous system management



The introduction of the new examination sequence control system increases the work efficiency by completely blocking mistakes and helps to improve patient experience and provide higher health care through accurate examinations. However, when new prescriptions are created, errors in the examination order may occur again, and new rules may be needed again. Therefore, the radiology department will continue to collaborate with 20 examination rooms and manage it continuously.