Possible solution for the problem of unread image interpretation reports: "The Gunma University Star Search"

画像診断報告書未読による医療事故防止のための試み

Yoshito Tsushima MD PhD[1], Hiromi Hirasawa MD PhD[1]
Yu Wakabayashi MD[1], Soma Kumasaka MD PhD[1]
Kazumi Tanaka MD PhD[2], Makiko Takizawa MD PhD[2],
Ayako Taketomi-Takahashi MD PhD[1], Takayuki Suto RT MS[3]
Yasuhiro Komatsu MD MPH PhD[2]
[1] Department of Diagnostic Radiology and Nuclear Medicine
[2] Department of Healthcare Quality and Safety
Gunma University Graduate School of Medicine
[3] Department of Radiology, Gunma University Hospital

Basic Concept

1.Timely effective communication of radiology reports to those who treat the patients (referring physicians) is essential.
2. Failure to appropriately communicate findings may be a leading cause of malpractice action.

Medical Accidents due to Unread Radiology Reports

1. In 2016 to 2017, many medical accidents were reported due to unread radiology interpretation reports regardless of the size of the hospitals in Japan.
2. This issue of communication error became a big social problem, and many hospitals were accused.

Standards for the communication of radiological reports and fail-safe alert notification by The Royal College of Radiologists

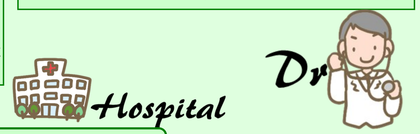
All radiological reports should be *produced*, *read* and *acted* upon in a timely fashion, best to serve the patients' needs.

Clinical Radiology
The Royal College of Radiologists

Responsibilities

Radiologists
- To produce reports as quickly and efficiently as possible
- To flag reports with they feel a fail-safe alert is required

Requesting doctors & clinical teams
- To read and act upon the report findings



Employing organization
- To insure fail-safe systems are in place

Our New Strategy

1. We, radiologists in our hospital, decided to start reviewing that all semi-emergency imaging findings were recognized and accurately acted upon by referring physicians.
2. Serious medical accidents were unlikely to occur even if reports of "normal study" or totally benign findings were not correctly conveyed.
3. Therefore, we focused only on the reports containing important semi-emergency findings.

Example
Follow-up CT of the whole body after surgical treatment of rectal cancer

Radiology report
Name ***** Date*****
Examination *****

Findings
****
****

Impression
No evidence of recurrence or metastasis.

Even if this report was not correctly conveyed to the referral physicians, it is extremely unlikely that serious medical accidents may occur.

Aims of this study

1. To propose a new strategy preventing medical errors caused by unread radiology interpretation reports
2. To evaluate its efficacy.

Our New Strategy !

Semi-emergencies
Put Two stars ★★

Medical issues needing addressing within 2 weeks

in the impression section of the imaging interpretation reports

Example
Follow-up CT of the whole body after surgical treatment of rectal cancer

Radiology report
Name ***** Date*****
Examination *****

Findings
****
****

Impression
★★ 1) New primary cancer (15mm) in the right upper lobe, susp.
2) No evidence of recurrence or metastasis.

This information must be transmitted reliably !!!

The duty radiologist: After TWO WEEKS

1. Search for double stars ★★ in the reporting system
2. Review the reports and patients' charts
3. Confirm that the information had been correctly conveyed and that the referral physicians appropriately acted upon them

The physicians had: IF

1. Not read the reports
2. Not recognized the semi-emergency findings (even if they opened the reports)
3. Mis-interpreted them or not appropriately acted upon

NEXT

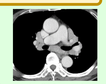
Contract by telephone !

Results

62,143 reports in one year (255 reports/day) in our hospital

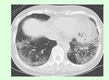
Semi-emergencies: 321 reports (0.52%): 1.32 reports/day

1. New unexpected (suspected) malignant tumors	186
2. Unexpected spreads of known malignancy	39
3. Cardiovascular semi-emergencies +	37
4. Intracranial semi-emergencies ++	13
5. Others	46



Preoperative CT for gastric cancer: Sarcoidosis was highly suggestive.

Preoperative CT for gallstones: Rectal cancer was incidentally found.



Preoperative CT for rectal cancer: Interstitial pneumonitis was highly suggestive.

Mis-communication cases: 23 reports !!! (7.17% of two-stared reports)

1. New unexpected (suspected) malignant tumors	15
2. Unexpected spreads of known malignancy	2
3. Intracranial emergencies +	1
4. Others	5

+ In the three cases of (suspected) brain infarction, the radiologists did not think that immediate treatment was necessary, since the infarction was small and subacute phase.

Suggests automatic confirmation of reports having been opened is insufficient !!!

Reason for mis-communication

1. Reports not being opened	17
2. Relevant information on reports being overlooked !!! (The reports were opened!)	5
3. The wrong report being opened	1

Discussion

Semi-emergencies Two stars ★★

- We radiologists ensured the proper transmission of the semi-emergency imaging findings
- We were able to avoid communication errors that could lead to medical incidents in at least 23 cases in one year !!!

- Only several cases per day.
- The increase in labor of radiologists by this trial was small enough:
  (1) Check charts of only several patients every day (20 minutes)
  (2) No need to refurbish any computer systems
  (3) Can be implemented immediately, irrespective of the size of facilities

Risk-based Approach

Allows to prioritise activities based on severity of risk

Goal
Appropriate measures are taken *focusing on high-risk cases*

Efficient ! Less cost !
Need to identify risk factors
Need of data collection & analysis

Lets' ensure *only* the correct transmission of important information !

Our New Strategy !

Conventional Approach

Should be perfect !

Goal
All reports are read !

Inefficient ! High cost !
No prioritisation
Need of MANY resources

Do we really need to check *all* the reports ?

Common sense

Emergencies
Put Three stars ★★★

The referring physician was immediately contacted by telephone !

65 reports (0.10%): 0.27 reports/day

- Medical issues addressing as emergencies included acute abdominal diseases, PTE/DVT, intracranial emergencies, unexpected spreads of known malignancy, acute aortic diseases… etc….
- Communication by telephone or in person is usually appropriate.
- Therefore, we suspect that communication errors are rather unlikely.

Q & A

Q: Warning system by IT system may be enough for reducing the risk of unread reports ?

A: Electric fail-safe alert for *all* reports may not be an ideal.

?WHY?

1.Are you familiar with alert fatigue? The warning should be only *when "really" urgent*.

2. High cost of engineering renovation and/or human resources

3. No guarantee of accurately receiving the important information, even when opened the reports.
*** In fact, in 5 cases of our study, referral physicians opened the reports, but did not recognize the starred semi-emergency findings! ***

Lets' ensure *only* the correct transmission of important information!

Our New Strategy !

Possible Drawbacks

1. Referring physicians may depend on this system and may become not to carefully read unmarked reports.
2. We have to reconfirm that it is the basic responsibility of the referring physicians to timely and carefully read the reports.

Future

We suspect that it possible for AI technology to replace this system.

Study Limitations

1. This study was performed in a university hospital, and the efficacy of the proposal measure should be confirmed in other academic institutes and private hospitals, although we suspected that this measure may be effective regardless of the size of hospitals.
2. The decision of whether or not to add stars was left to each radiologist, and detailed protocol was not defined. Although we could have prepared detailed guidelines, we suspected that complicated rules would have decreased efficacy. Ease is a great advantage of our new strategy.
3. We defined semi-emergencies as medical issues needing addressing within two weeks, but we did not have any evidence that "two weeks" was the appropriate period for this definition. If medical issues needed addressing in less than two weeks, the radiologists in our department had the option of adding three stars.
4. The definitions of semi-emergency and emergency should be defined according to the characteristics of the facility.
5. In many cases with emergency findings, if radiologists thought that their communication was totally secured, they did not prefix three stars. Thus, the incidence of emergency findings was much underestimated in this study.

Conclusions

Our new strategy to prevent communication errors of radiology interpretation reports was found to be effective !!!

1. No requirement of a medical informatics system upgrade !
2. Minimum additional effort of radiologists and referral physicians !
3. Can be implemented immediately regardless of the size the facility !
4. No risk of alert fatigue !

The professional approach to quality practice in radiology requires radiologists to take responsibility beyond report generation in order to influence patients' care.

References
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