

Electronic Progress Note Template Improves Documentation of Contrast Extravasation Events

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Purpose

- **CT contrast extravasation events** are common, occurring in ~1/100 - 1/1000 patients:
 - Although most are self-limited, physician evaluation and clinical follow-up is recommended to assess for signs and symptoms or more serious complications such as **compartment syndrome** or **skin ulceration**.
 - The ACR further recommends that all CT contrast extravasations and any related treatment should be **documented** in the medical record, particularly the radiology report, and the ordering physician should be notified.
- Conversely, **MRI contrast extravasations** are **rare** and rarely require physician evaluation or clinical follow-up:
 - Gadolinium based contrast media is less toxic to the skin and subcutaneous soft tissues.



Purpose

- The purpose of this quality improvement project was to measure how the creation of a **standardized progress note template** in the electronic medical record (EMR) impacted the **presence** and **consistency** of radiologist documentation of initial physical evaluation and of patient as well as provider **communication**.



Methods

- All extravasation events at our hospital are filed through an **online safety event** management reporting and tracking system.
 - Events over a 6-month baseline period (March to September 2017) were reviewed to determine the presence of **EMR documentation** on initial radiologist evaluation and treatment.
- Our intervention was the creation of **two standardized 'SmartText' contrast extravasation progress note templates** with **embedded** pick lists/mandatory fields; separate templates were designed for **inpatients** and **outpatients**.



Progress Note Templates

RADIOLOGY PROGRESS NOTE: Report of Contrast Extravasation

During the intravenous injection of contrast for a CT scan, *** ml of Iovue 370 extravasated from the patient's peripheral line in the ***. I have examined and evaluated the patient. I have also explained to the patient the warning signs of compartment syndrome and other complications and instructed them to either call their nurse/doctor or return to the ED for further treatment should they develop these symptoms.

FINDINGS:

Pain: {yes no:315493} Details: ***
Paresthesias: {yes no:315493} Details: ***
Change in strength: {yes no:315493} Details: ***
Abnormal skin findings: {yes no:315493} Details: ***
Pulses: Site: *** Left *** Right ***
Other Findings: ***

PLAN:

- 1) Please keep the affected extremity elevated.
- 2) Apply cold compresses intermittently, for no longer than 20 minutes at one time.
- 3) You should follow the patient with serial neurovascular physical examinations.
- 4) Based on my assessment (extravasation volume or concerning physical findings), an immediate surgical hand consultation {is/is not:21397:::0} recommended at this time. You can reach the hand consultant via the hospital page operator. If the patient's initial physical examination changes, the hand consultant should also be contacted.
- 5) Further clinical management is at the discretion of the primary team. However, please do not hesitate to contact me with any questions.

These findings were discussed with and acknowledged by: *** on 10/21/19 at ***

During the intravenous injection of contrast for an imaging study, *** ml of *** extravasated from the patient's peripheral line in the ***.

The patient {was/was not} monitored in the holding area for *** minutes.

I have examined and evaluated the patient. I have also discussed with the patient the warning signs of compartment syndrome. I instructed the patient to either visit the closest ED or call their nurse/doctor, should they develop these symptoms.

FINDINGS:

Pain: {yes no:315493} Details: ***
Paresthesias: {yes no:315493} Details: ***
Change in strength: {yes no:315493} Details: ***
Abnormal skin findings: {yes no:315493} Details: ***
Pulses: Site: *** Left *** Right ***
Other Findings: ***

PLAN:

- 1) Based on my assessment (extravasation volume or concerning physical findings), further management, including transfer to the ED or surgical hand consultation {is/is not:21397:::0} recommended at this time.
- 2) The patient was discharged in stable condition and asked to:
 - Please keep the affected extremity elevated.
 - Apply cold compresses intermittently, for no longer than 20 minutes at one time.
 - Call their nurse/doctor or visit the closest ED if signs/symptoms concerning for compartment syndrome develop.
 - Call the radiology department with any questions.
- 3) The patient was provided with instructions regarding contrast extravasation, signs/symptoms of compartment syndrome, and how to contact the radiology department if needed.



Inpatient

Outpatient

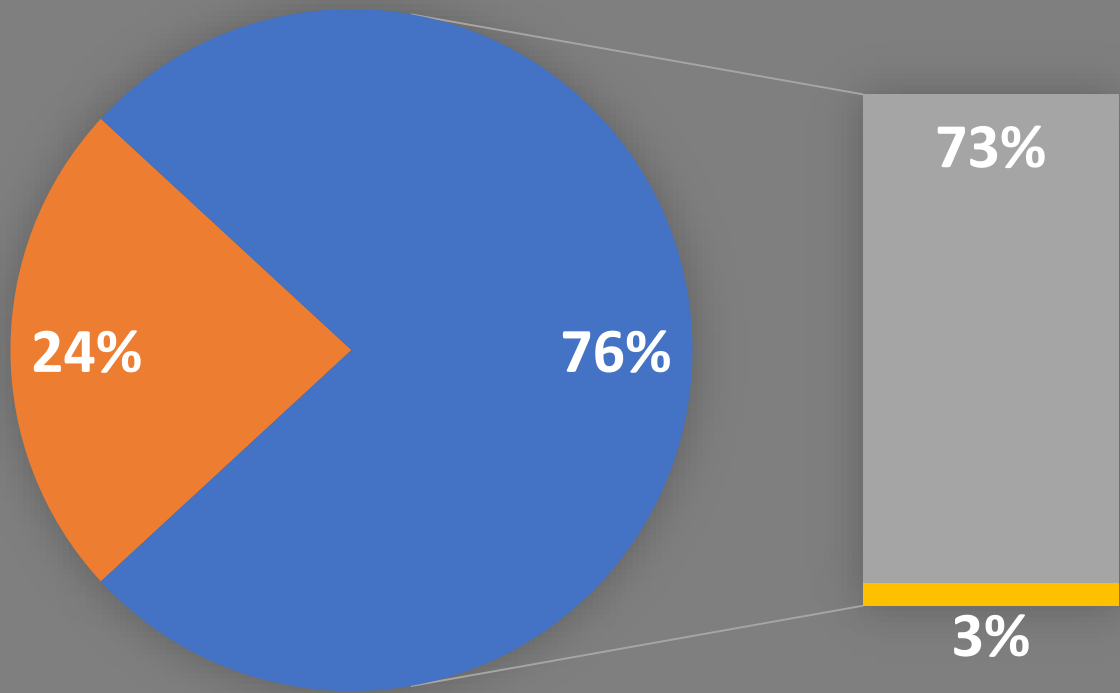
Methods

- Trainees, staff and technologists were all educated regarding the new templates and documentation workflow.
- All extravasations during the first six months of the standardized template roll-out (February to August 2019) were reviewed for documentation of radiologist evaluation and treatment.



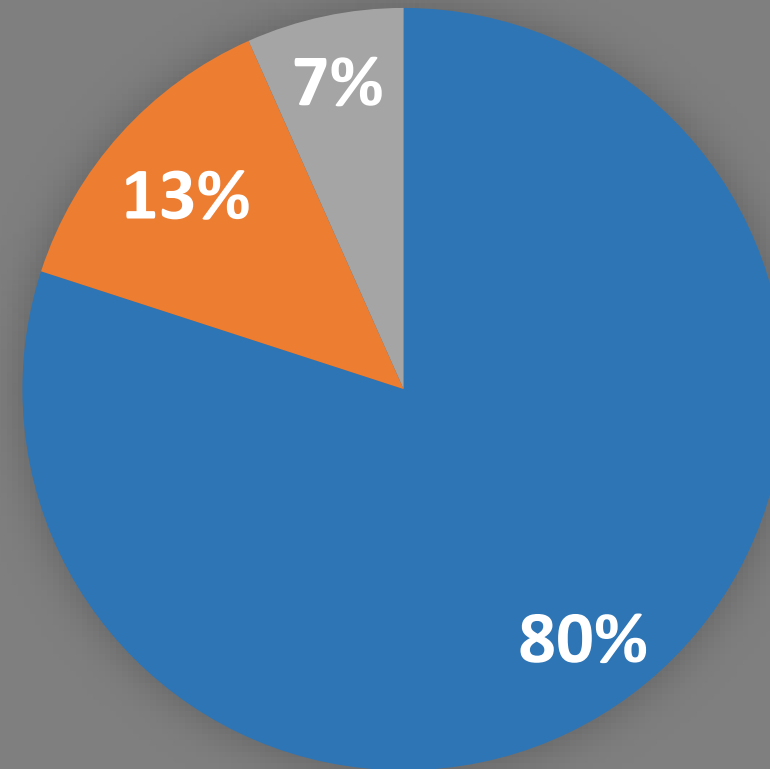
Results - CT

Pre-Intervention (n=59)



- No Documentation
- Hand-Filled Form Scanned Into Patient Chart
- Free Text Progress Note

Post-Intervention (n=60)



- Documentation Using Template
- No Documentation
- Event Handled by Primary Team at Scanner



Results (2)

- Regarding MRI contrast extravasation events:
 - Before the intervention, no progress notes documenting the event were present in patient charts (0/22 events).
 - After, 5/17 events (22%) were documented using the progress note templates.
- Use of the standardized progress note templates in CT and MRI led in **all** cases to **consistent** reporting of physical exam findings, discharge instructions for outpatients (n=31), and communication with clinical house staff for inpatients (n=22).
- A single emergent hand surgery consult was required in each six-month period.



Conclusion

- Standardized contrast extravasation progress note templates in the EMR with embedded pick lists **improve** consistent **documentation** of physical examination findings, as well as patient and provider **communication**.
- Questions?
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