Electronic Progress Note Template Improves Documentation of Contrast Extravasation Events

V.S. Sotirchos, MD, D. Lee, MD, C. Shah, MD, T. Martin-Carreras, MD, S.G. Alkhatib, MD, P. Remeis, RN, B. Zigmund, MD, H.M. Zafar, MD

Hospital of the University of Pennsylvania
Philadelphia, PA
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.
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**

**Inpatient**

RADIOLOGY PROGRESS NOTE: Report of Contrast Extravasation

During the intravenous injection of contrast for a CT scan, *** ml of Isovue 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:**

<table>
<thead>
<tr>
<th>Pain:</th>
<th>(yes no:315493) Details: ***</th>
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<tbody>
<tr>
<td>Paresthesias:</td>
<td>(yes no:315493) Details: ***</td>
</tr>
<tr>
<td>Change in strength:</td>
<td>(yes no:315493) Details: ***</td>
</tr>
<tr>
<td>Abnormal skin findings:</td>
<td>(yes no:315493) Details: ***</td>
</tr>
<tr>
<td>Pulses: Site: *** Left *** Right ***</td>
<td></td>
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<tr>
<td>Other Findings: ***</td>
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**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 ***

**Outpatient**

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

The patient 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.

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**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.
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.
Pre-Intervention (n=59)
- No Documentation: 24%
- Hand-Filled Form Scanned Into Patient Chart: 76%

Post-Intervention (n=60)
- Documentation Using Template: 80%
- Event Handled by Primary Team at Scanner: 13%
- No Documentation: 7%
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?
  • vlasios.sotirchos@pennmedicine.upenn.edu
  • hanna.zafar@pennmedicine.upenn.edu