

Streamlining Communication of Clinical History in the Emergency Department: A Multidisciplinary Approach

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Purpose

Clinical history is an essential part of any radiologic assessment, and available literature shows radiologic interpretation is both more sensitive and more accurate when relevant clinical history is available.

When a clinical history is provided, details are often inadequate, leaving a short phrase, such as "pain s/p trauma."

Ultimately, this limits study quality and increases the likelihood of additional testing or repeat imaging, increasing cost and negatively impacting patient experience.

Our goal is to improve the clinical history available to radiologists interpreting emergency department imaging, without adversely affecting the workflow of radiologists or ordering clinicians.

State of the problem: analysis

To evaluate the quality of provided clinical history, we adapted a three-element “what-when-where” history model¹ (Table 1) to retrospectively review the provided histories of randomly selected initial musculoskeletal radiographs ordered in the emergency department over a five day period, prior to our intervention.

Four radiology residents scored each history 0 (no history elements) to 3 (all history elements), reaching a consensus in each case based on set history element definitions.

Of 152 of clinical histories provided with emergency department musculoskeletal radiograph orders, **92.8% of provided histories contained zero or one history element and only one case contained all three history elements (Table 2).**

Table 1. “What-When-Where” Definitions

What	Description of mechanism or nature of injury/complaint, must include at least one specific descriptor.
When	Duration of symptoms or time of injury.
Where	Focal site of pain or abnormality, must include at least one localizing descriptor beyond the study title.

Table 2: Clinical history elements per case

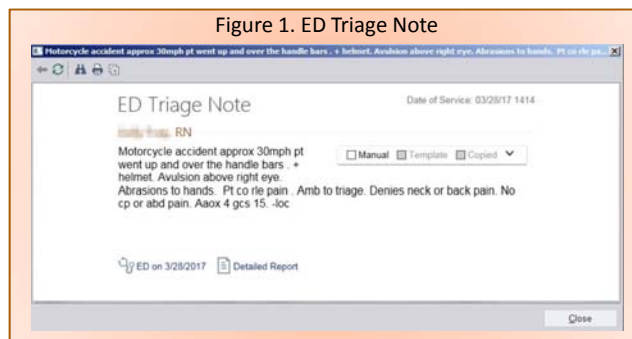
	Total	% of total (152 cases)
Zero	74	48.7%
One	67	44.1%
Two	10	6.6%
Three	1	0.7%

¹Hawkins CM et al. Improving the availability of clinical history accompanying radiographic examinations in a large pediatric radiology department. Am J Roentgenol. 2014 Apr; 202(4): 790-6.

Methods: the solution

We identified a note immediately available for every patient entering the emergency department, written by emergency department nurses, named the “ED triage note” (Fig 1). Accessing this note required time-consuming chart navigation, infeasible in a high-volume work environment.

Figure 1. ED Triage Note



Methods: the solution

At our institution, an “EMR worksheet” with pertinent study information is displayed on the PACS workstation when an imaging study is opened. Prior to our intervention, the only clinical history available on this worksheet was history provided by the ordering clinician.

We orchestrated a reprogramming of the “EMR worksheet” to directly display the “ED triage note” summary (Fig 2, orange arrow) on the radiologist workstation adjacent to the provided clinical history (Fig 2, green arrow). This summary could be clicked to display the entire note (Fig 2, blue arrow).

Figure 2. EMR worksheet screenshot with ED triage note summary (orange arrow) and provided clinical history (green arrow). ED triage note expanded after clicking the note summary (blue arrow).

The screenshot displays a patient's EMR worksheet. The 'ED Triage Note' section is highlighted with an orange arrow. The 'Exam Summary' section, which includes clinical history, is highlighted with a green arrow. A blue arrow points from the 'ED Triage Note' summary to the expanded view of the note, which shows details of a motorcycle accident and patient status.

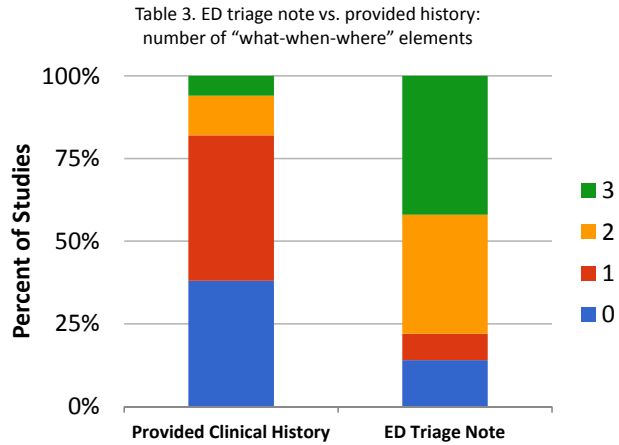
Department	Provider	Time	Visit Type	Status
HOSP DX	DX MH (ER ROOM 2)	2:40 PM	CHEST 1 VIEW	Completed
HOSP CT	CT MH - CT SUITE 1	2:50 PM	CT HEAD WITHOUT CONTRAST	Completed
HOSP DX	DX MH (ER ROOM 2)	5:45 PM	SHOULDER 2+ VIEWS, RIGHT	Completed
HOSP CT	CT MH - CT SUITE 1	8:45 PM	CT HEAD WITHOUT CONTRAST	Completed

Lab Component	Value	Last 90 days	Most Recent
Creatinine Clearance (ml/min)	89.8		
CREATININE	0.99		3/28/2017 1436
BLOOD E-GFR	>60		3/28/2017 1436
AFRICAN AMERICAN E-GFR, NON-	>60		3/28/2017 1436
AFRICAN AMERICAN INR	1.05		3/28/2017 1751
APTT	43.9		3/28/2017 1751
WHITE BLOOD CELL COUNT	7.4		3/29/2017 1057
HEMATOCRIT	41.4		3/29/2017 1057
POTASSIUM	3.9		3/28/2017 1436
SODIUM	138		3/28/2017 1436
PLATELET COUNT	240		3/29/2017 1057

Results: ED triage note utility

To confirm the utility of the ED triage note, the “what-when-where” model was applied to both the provided clinical history and ED triage note in 50 patients. Four radiology residents scored each history 0 (no history elements) to 3 (all history elements), reaching a consensus in each case.

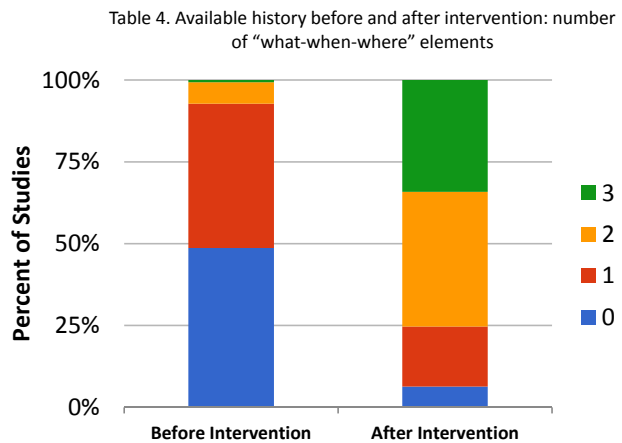
The ED triage note contained at least two history elements in 78% of histories compared to 18% of provided clinical histories (Table 3).



Results: clinical history elements

After implementation, we retrospectively reviewed the clinical history available within the “EMR worksheet” for 158 initial musculoskeletal radiographs from the emergency department. Four radiology residents scored each history 0 (no history elements) to 3 (all history elements), reaching a consensus in each case. Findings were compared to the pre-intervention evaluation of 152 emergency department radiographs described in Table 2.

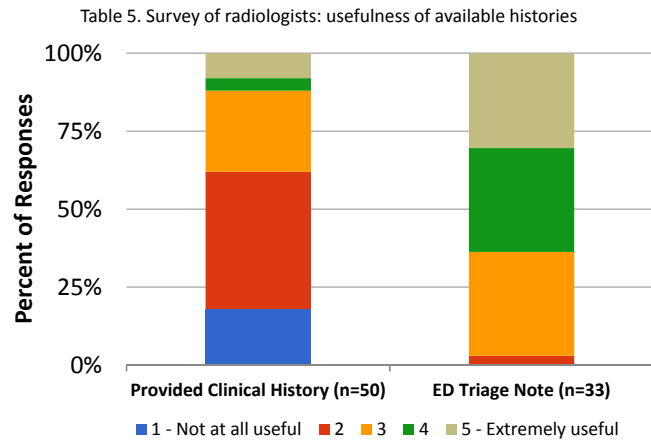
Two or three history elements were present in 118/158 cases (75%) compared to 11/152 cases (7.2%) before intervention (Table 4).



Results: radiologist satisfaction

To evaluate radiologist opinion of the ED triage note, we surveyed radiology faculty, fellows, and residents prior to the intervention and three months after the intervention regarding their perceptions of clinical history available on the EMR worksheet. They rated usefulness of clinical history on a scale from 1 (not useful at all) to 5 (extremely useful).

Prior to intervention, clinical history available on the EMR worksheet received a 3, 4 or 5 in 38% of respondents. After intervention, 97% of respondents answered 3, 4 or 5. (Table 5)



Conclusion

Reprogramming the EMR to display supplemental clinical acquire acquired by emergency triage nurses dramatically increased the comprehensiveness and perception of usefulness of clinical information immediately available to the radiologist without disrupting workflow.