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Editorial

The Admission Checklist: The key steps and responsibilities for the admitting resident

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ABSTRACT

The process of admitting patients from the emergency department to the general medicine floor is foundational to the medical training process and medical practice more generally. Yet this process is rife with potential error if not approached systematically, and residents rarely receive explicit teaching in this area. The creation of an "Admission Checklist" proposed by the authors could serve the function of reducing error and enhancing inter-provider communication throughout this process. Such a checklist could improve trainee experience and education, and ultimately allow for improved outcomes for patients during transitions of care.

1. Introduction

While recent quality improvement research has focused on optimizing the inpatient medical admission process, the role that residents play in this task remains unexamined, despite their central importance at academic medical centers [1]. The admitting resident's role is rife for potential error given the heterogeneity of house staff experience, perceived barriers in seeking help from attending physicians, and contextual factors specific to the local institution and patient being admitted [1,2].

Given these challenges and the consequences of mismanaged admissions [3] it is curious that there is typically an absence of formal education on a systematic approach to the process of inpatient admission in residency [1]. Indeed, most explicit education for residents occurs in medical school, where students are taught the standardized process of taking a history and performing a physical exam, whereas the actual process of admitting a patient often falls under the domain of "experiential learning" in residency, fraught with possible knowledge gaps [4].

One approach to standardizing complex medical processes is that of "checklist" creation, which has found particular favor among the surgical subspecialties [5]. Checklists standardize complex processes and ultimately allow for both enhanced efficiency and improved outcomes if applied appropriately [6].

Given the complexity of the medical admission process and the lack of formal resident education in this area, creating an "admission checklist" could serve to both streamline this task for residents and improve patient safety, particularly during the first hours of the admission process where the heightened risk of medical errors tends to occur [1,3].

2. The job of the admitting resident: one purpose, three responsibilities

As with any systematic attempt to improve outcomes, one should begin by defining the purpose of the process in question [7]. While recent work has sought to explicitly clarify the goals of inpatient admission to improve patient outcomes [8], these efforts have examined the processes that occur after the patient has been admitted, rather than explicating the purpose of the admission process itself. Thus, it is crucial to explicitly clarify the main purpose of the resident physician in any admission, which we propose is to ensure a safe transition from the emergency department (ED) to the general medicine floor. This overarching purpose gives rise to three distinct responsibilities of the admitting resident which must be met for every admission:

- To confirm that the general medicine floor is the appropriate disposition for the patient based on preliminary assessment of vital signs, laboratory and imaging findings, and putative admitting diagnosis.
- To ensure that the patient has been appropriately resuscitated in the ED prior to transfer to the floor.
- To ensure that any further resuscitative measures following admission from the ED are implemented once the patient arrives to the floor to prevent decompensation.

In light of this overarching purpose and the three corollary responsibilities, we propose the following process as a checklist to accomplish for every inpatient admission to achieve these goals (Fig. 1).

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Step 1: Prepare for the Admission	Step 2: Call Back the Admission Page	Step 3: Admit the Patient
• Assess vital signs • Review labs • Review imaging • Review medication administration record • Document problem list • Review ED note and/or nurse triage note	• Receive ED signout • Review provisional diagnosis • Review empiric resuscitative therapies • Clarify any pending labs, imaging, or consultations	• Perform thorough history and physical exam • Identify the acute "can't miss" problem or problems • Place patient orders • Seek help from attending physician if needed
Responsibility #1	**Responsibility #2**	**Responsibility #3**
• Based on vital signs and initial lab, imaging and medication administration record data, is the patient's disposition appropriate (floor or ICU)?	• Have emergent resuscitative interventions been initiated in the ED? • Are there any critical studies pending that could change patient disposition?	• Have essential orders for continued patient stabilization been continued from the ED or ordered when admitting the patient? • Do you need to review the patient with the attending at the time of admission to ensure safe and effective care?

Fig. 1. The admission checklist.

3. Responsibility #1: Ensure the general medicine floor is the appropriate disposition

3.1. Prepare for the admission

When the admitting resident receives the admission page, systematic preparation is crucial to prevent the mistakes that occur due to time pressure and heavy inpatient census numbers [2]. The resident, through chart review, should make an initial assessment of whether responsibilities one and two are accomplished prior to calling back the admission page, performed in an efficient manner to accord respect to the emergency provider for whom timely sign-out is an important consideration.

3.2. Assess vital signs

There is no single piece of objective information that more directly informs patient disposition than vital signs. Review of vital signs serves as the initial lens through which the resident can perform her preliminary triage for admission appropriateness, as early floor-to-ICU transfer has been shown to result in longer hospitalizations and higher mortality rates [9].

This review should be comprehensive, assessing for temperature, heart rate, blood pressure, respiratory rate, and oxygen saturation. The resident should moreover note whether the patient is requiring support for maintenance of vital signs, including respiratory support or resuscitative fluids. In the course of this comprehensive review, if vital sign derangements raise concern for clinical conditions of shock or respiratory failure, the resident must seek clarity on disposition in her subsequent conversation with the admitting ED clinician [10].

Yet it is rare that patients with such vital signs are flagrantly mistriaged; rather, it is the so-called "borderline" patients who are more challenging to triage appropriately [3]. In these instances, paying attention to vital sign trends and ensuring repeat vital signs are recorded in the EMR following initial resuscitation is integral.

3.3. Assess labs, imaging, and medication administration record

After initially assessing the vital signs, the admitting resident should next examine lab results in her chart review. The resident's goal is now to ensure that there are no laboratory derangements or imaging findings that might preclude general medicine floor admission, as patients may also meet ICU indications for conditions that require frequent lab draws or closer nursing supervision, such as severe hyponatremia. It is also true that imaging that is pertinent to the admitting diagnosis can affect patient readiness for admission, such as a chest CT for a stable but hypoxic patient indicative of a pleural effusion requiring chest tube placement prior to admission.

In addition to determining whether laboratory or imaging findings warrant ICU admission, it is crucial for the resident to note any pending test which may change patient disposition when it returns or may warrant further primary resuscitative measures prior to admission. An example might be a patient who is being admitted for hypoxia of unclear etiology whose chest x-ray has yet to be performed.

Finally, to complete the "objective" assessment of the patient's chart, the resident should examine the medication administration record to see the therapies that have been implemented. The purpose here is to determine whether the patient in the ED has in fact received appropriate resuscitation for their admission diagnosis, for example ensuring that patients whose labs and imaging are concerning for community-acquired pneumonia receive antimicrobials while in the ED [11].

3.4. Document problems

While the resident is assessing a patient's vital signs, labs, imaging, and medication administration record, she should note any

derangements and catalogue these as "problems" on her problem list. Early synthesis of the "problem list" promotes a systematic approach to the earliest stages of clinical reasoning, including dual process thinking, alignment with known illness scripts, problem categorization, and metacognition [12]. This exercise prevents her from committing anchoring bias which may arise by first reading the ED clinician's assessment.

3.5. Read the emergency provider's note

Once the resident has gathered all the above objective information, begun to formulate her problem list, and hypothesized the reason for admission based upon this data, her next task is to read the emergency provider's note. This should be done to clarify the emergency provider's assessment and to check this against her own interpretation of the objective data.

It is important to note that this process of assessing for findings which might preclude admission to the general medicine floor may lead to tension between ED clinicians and hospitalists, given the competing respective goals of expeditious disposition and putative diagnosis and initial management [13]. Yet the purpose of such a systematic approach is to make these potential areas of disagreement more objective, focused on specific vital sign, lab, or imaging findings rather than more subjective appraisals of a patient's candidacy for floor admission.

4. Responsibility #2: Ensure that the patient is appropriately resuscitated prior to accepting the admission

4.1. Call back the admission page

After the resident has gathered the above objective information and created a preliminary problem list, she should prepare to call back the admission page. It is crucial that the resident view this communication with the emergency provider strategically, with particular goals in mind.

The resident's first responsibility is to carefully attend to the emergency provider's description of the patient's presentation, particularly if there is no recorded note yet. After receiving signout, the resident should raise any concerns about findings from her preliminary chart review which might call into question the patient's candidacy for floor admission. If there are no such concerns, any further questions should only be for the purpose of clarifying information relevant to pending studies or resuscitation. Throughout this process, the resident should not view the ED clinician as her antagonist, and should avoid asking any questions that are not directly pertinent to the overall goal of facilitating a safe transfer to the general medicine floor.

As noted above, there is potential for discord in the handoff process between the ED clinician and the admitting resident, due to the sometimes competing goals of emergency and floor clinicians [14]. This may take the form of so-called "triage discordance," or a disagreement in the appropriate level of acuity for the patient being admitted, or in some cases, whether a patient should be admitted at all [15].

It is for this reason that the admitting resident should base her assessment on the appropriateness of the admission on objective information and ask questions relevant to this, rather than raising concerns that are not immediately relevant to the safe transfer of the patient from the ED to the general medicine floor.

5. Responsibility #3: Ensure that the patient receives appropriate care following admission

5.1. Identify the "must not miss" problems

After the admitting resident has accepted the patient for admission and performed a thorough history and physical exam, her final task is to identify and address the most time-sensitive and dangerous medical problems. The task of admitting patients with multiple acute medical problems or comorbidities can prove quite challenging for admitting residents, particularly those with busy services and high inpatient censuses.

While the resident should be comprehensive in attempting to identify all present problems, her overriding task should be to identify the most relevant problem or problems that require time-sensitive intervention. These problems may involve presenting signs or symptoms or lab derangements, or may be existing problems for which home therapies must be continued. It is only through identifying these "must-not miss" problems that the resident can truly accomplish her overall goal of facilitating safe transition to the floor and stabilization.

One alternative way to frame this goal is for the admitting resident to ask herself, "Which problems, if missed, will result in this patient decompensating and requiring a higher level of care overnight?" Most residents likely learn this process of consolidating their diagnostic thinking amidst complicated patients and busy censuses implicitly, but it is important to explicitly identify this goal such that it always "checked off."

5.2. Seek help when help is needed

There is likely great variability between academic institutions with respect to when and how admissions are communicated to the attending physician, and residents must clarify institutional and individual attending preferences in this area. Regardless of attending preferences, however, it is crucial that residents feel empowered to reach out to others for help if problems or questions arise in the admission process. The virtue of humility and ability to ask for help is of crucial importance in today's increasingly complex medical training environment, particularly for supervising residents new to this role.

6. Conclusion

As noted previously, the area of medical transitions, particularly inpatient admissions, has received newfound attention as a focus for quality improvement in hospital medicine, and is of specific importance to resident physicians with varying degrees of experience [1].

Given these challenges, the systematic "checklist" approach delineated above might serve as an important tool for clinician-educators or residents themselves while admitting patients to make explicit the goal of the admission process, as well as the corresponding responsibilities of the admitting clinician. In addition to enhancing both efficiency and patient safety, adoption of such a "checklist" approach might improve communication between ED clinicians and hospitalists and mitigate so-called "professional tension" [13] which often arises when disagreements regarding admissions surface. Finally, the implementation of this framework might serve the crucial role of allowing senior residents to more readily and systematically teach junior trainees and students a replicable and durable method to succeeding in a task that is as challenging as it is ubiquitous.

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