

When Should a Surgical Resident Call an Attending Surgeon?

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BACKGROUND: Many interactions exist between surgical residents and attending surgeons, where residents debate whether they should “bother” to call an attending. Several instances have occurred when a senior resident or an attending has not been notified about a patient’s status by a junior resident. Because of poor communication, care might be delayed, and surgeons and patients’ relatives might not be informed of a change in status. Sometimes the resident’s initial management was different than an attending’s management. Communication issues were raised at our weekly Morbidity & Mortality conference. We decided to investigate the range of judgment as to when a resident should notify an attending surgeon.

STUDY DESIGN: The objective was to investigate the range of judgment as to when a surgical resident should notify an attending surgeon. The purpose of this study was to determine the clinical circumstances when surgical residents should contact an attending surgeon directly or leave a message with the service. To investigate communication questions, we developed a survey of 34 clinical circumstances in which a surgical resident could call an attending. Sixteen residents and 16 attendings completed the survey entitled “Conditions where a surgical resident should consider contacting the surgical attending.” From the information obtained from this study, a “must leave message” and “must speak to directly” list were created to guide residents as to when to call an attending.

RESULTS: A significant difference existed in the answers provided by residents and attendings. Residents and attendings agreed universally that an attending should be spoken to directly for 2 reasons: cardiopulmonary arrest and death. We created a “must speak to directly” list based on the attendings’ answers. This list includes 10 clinical circumstances in which a surgical resident should speak directly with an attending regarding patient issues. Likewise, a “must leave message” list was created of an additional 8 reasons when a surgical resident must at least call the service of an attending and leave a message.

CONCLUSION: The purpose of our study was to help standardize communication between surgical residents and attendings regarding patient status. With these 2 standardized “must” lists, residents will have less uncertainty or hesitation to awaken an attending at night. This finding should improve the communication skills of surgical residents and ultimately improve the quality of patient care. (*J Surg* 65:206-212. © 2008 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: communication, notification, morbidity, mortality, near misses, survey

COMPETENCY: Patient care, Interpersonal and Communication Skills, Practice Based Learning and Improvement

INTRODUCTION

The purpose of this study was to determine the clinical circumstances where surgical residents should contact an attending surgeon. Communication lapses among physicians have been documented to be a significant factor in medical errors.¹⁻⁵ In their study evaluating information transfer and communication between surgery residents and attendings, Williams et al⁶ concluded that systematic rules should be established about when surgical residents should call attending surgeons. Attending notification regarding change in patient status has been questioned at our weekly Morbidity & Mortality conference. Our residents’ judgments of what clinical circumstances require attending notification have also been questioned. Communication lapses and problems between surgical resident and surgeon were key contributors to delay in patient care, serious adverse patient consequences, and near misses.⁶ As part of an 8-year analysis of surgical morbidity and mortality, we surveyed attendings and residents as to conditions in which a surgical resident should consider contacting the surgical attending.⁷

According to an Australian retrospective study, the most common cause of 14,000 preventable deaths was communication problems.⁸ In another study by Gawande et al,⁹ communication breakdown was felt to contribute to 43% of adverse surgical events. Communication breakdowns were again found to contribute to injuries in one quarter of the surgical errors.

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Conditions Where a Surgical Resident Should Consider Contacting the Surgical Attending

Write "1" if attending should be spoken to at anytime
Write "2" if message should be left with service
Write "3" if no call necessary

- | | |
|---|--|
| <input type="checkbox"/> Abnormal labs
<input type="checkbox"/> Admission to the hospital
<input type="checkbox"/> Attorney mentioned
<input type="checkbox"/> Cardio-Respiratory Arrest
<input type="checkbox"/> Chest pain
<input type="checkbox"/> Consent issue for procedure
<input type="checkbox"/> Death
<input type="checkbox"/> Drug Reaction
<input type="checkbox"/> Family concerns
<input type="checkbox"/> Fever over 102°
<input type="checkbox"/> Hemodynamic instability
<input type="checkbox"/> Insertion of nasogastric tube
<input type="checkbox"/> Invasive procedure or operation needed
<input type="checkbox"/> Ischemic peripheral vascular finding
<input type="checkbox"/> Left against medical advice
<input type="checkbox"/> Medication error requiring treatment
<input type="checkbox"/> Myocardial Infarction
<input type="checkbox"/> Need for intravenous access
<input type="checkbox"/> Need for intubation | <input type="checkbox"/> Need for restraints
<input type="checkbox"/> New consult
<input type="checkbox"/> New GI Bleed
<input type="checkbox"/> New major wound complication
<input type="checkbox"/> Neurological change
<input type="checkbox"/> OR case cancelled
<input type="checkbox"/> Pathology report
<input type="checkbox"/> Patient fall
<input type="checkbox"/> Patient wants different attending
<input type="checkbox"/> Positive blood cultures
<input type="checkbox"/> Psychiatric patient issue
<input type="checkbox"/> Pulmonary embolism
<input type="checkbox"/> Transfer to ICU
<input type="checkbox"/> Transfusion order
<input type="checkbox"/> Urine output low
<input type="checkbox"/> Other _____

_____ |
|---|--|

Please indicate:

Attending _____
Resident _____ PGY _____

FIGURE 1. Monmouth Medical Center, Department of Surgery, survey.

Failure to contact the attending surgeon in an appropriate period was an example of a communication breakdown. Rogers et al¹⁰ proposed the need for predefined circumstances in which an attending must be called. Our aim was to establish a list of clinical circumstances that would mandate attending notification and improve communication. The survey is presented in Fig. 1.

The Alameda County Medical Center listed 9 reasons that should prompt a chief trauma resident to notify the attending surgeon immediately.¹¹ These reasons include penetrating injury to head, neck, or torso; traumatic paralysis; long bone fracture; amputation at or proximal to wrist or ankle; all patients younger than 15 years of age; Glasgow Coma Scale score less than 10; systolic blood pressure less than 90; heart rate greater than 130; and respiratory rate less than 10 or greater than 30.

The University of Pennsylvania has a policy entitled "Attending notification and communication of major treatment decisions."¹² This policy states that "attending physicians must

be promptly notified when patients are admitted to the hospital on his/her service." If the patient is admitted to the intensive care unit, the policy is more specific because notification must be within 1 hour. The policy mandates that "attending physicians should be aware of treatment decisions for all major events in a patient's clinical course."

In the November 2003 issue of the *Residency Program Director's Alert*,¹³ 8 factors that require a resident to notify an attending were listed. These factors were admission to the hospital, transfer of the patient to the intensive care unit, need for intubation or ventilatory support, cardiac arrest or significant changes in hemodynamic status, development of significant neurologic changes, development of major wound complications, medication errors requiring clinical intervention, and any significant clinical problem that will require an invasive procedure or operation. We subsequently created an expanded list of reasons that might prompt attending notification by a surgical resident and created a sur-

vey. Greenberg et al¹⁴ concluded the need to document the triggers that mandate communication with surgical attendings. Their manuscript proposed 12 potential triggers prompting communication with the surgical attending. In the event any trigger occurred, a nurse or housestaff member was required to notify the attending. This formalized communication policy could lead to improvement in patient safety and could prevent serious injury to surgical patients.

METHODS

The current study was performed at Monmouth Medical Center, a 527-bed community, teaching, and university-affiliated hospital. The surgical residency at Monmouth Medical Center is a community-based teaching environment, with private and clinic patients. The attending surgeons allow residents to help manage their private and clinic patients on a daily basis and are always available if questions or concerns develop. Our program has

no fellows, so any questions regarding patient care are managed ultimately by either a senior resident or the attending surgeon.

Inspired by the 8 factors reported in the *Residency Program Director's Alert*, the authors created a list of 34 clinical circumstances that might mandate resident-attending contact (Fig. 1). The list was alphabetic, so no circumstance was prioritized. The clinical circumstances were intended to be objective. The same survey was distributed to 30 of our teaching attending surgical staff and 21 surgical residents. Sixteen attendings and 16 residents completed the survey. The attending surgeons all preferred to be contacted via their answering service rather than by e-mail or text messaging. Residents and attendings were given 3 action choices to choose from for each clinical circumstance at any time of the day: (1) direct call to the attending, (2) call answering service and leave a message, or (3) no call necessary. "Direct call to the attending" translates into speaking with the attending about the circumstance as soon as possible, usually within 15 minutes. However, "call

TABLE 1. Comparison of Each Question

No.	Action Choice	Attending			Resident			p
		"1"	"2"	"3"	"1"	"2"	"3"	
	Clinical circumstance							
1	Cardio-respiratory arrest	16	0	0	16	0	0	not tested
2	Death	16	0	0	16	0	0	not tested
3	Admission	15	1	0	16	0	0	0.970
4	Hemodynamic instability	15	1	0	10	4	2	0.092
5	Invasive procedure	15	1	0	16	0	0	0.970
6	Intubation	15	1	0	12	4	0	0.500
7	Pulmonary embolism	15	1	0	16	0	0	0.970
8	Transfer to intensive care unit	15	1	0	14	2	0	0.613
9	Gastrointestinal bleed	14	2	0	12	3	1	0.509
10	Wound complication	14	2	0	12	4	0	0.651
11	Ischemia	13	2	1	15	1	0	0.970
12	Myocardial infarction	13	3	0	15	1	0	0.593
13	Neurological change	11	4	1	9	6	1	0.741
14	Chest pain	10	5	1	5	7	4	0.151
15	Operating room case cancelled	10	6	0	12	4	0	0.648
16	Want different attending	10	5	1	8	6	2	0.724
17	New consult	9	6	1	12	4	0	0.131
18	Consent issue	9	5	2	5	6	5	0.285
19	Fever ≥ 102	7	5	4	2	5	9	0.096
20	Medication error	7	5	4	9	5	2	0.633
21	Transfusion	6	7	3	2	7	7	0.116
22	Left against medical advice	6	6	4	6	9	1	0.237
23	Family concern	5	7	4	3	8	5	0.713
24	Low urine output	3	8	5	2	3	11	0.095
25	Patient fall	3	7	6	0	7	9	0.166
26	Positive blood culture	3	7	6	0	4	12	0.555
27	Psychiatric concerns	3	6	7	0	7	9	0.168
28	Attorney mentioned	3	5	8	10	2	4	0.042
29	Drug reaction	3	5	8	4	6	6	0.771
30	Restraints	3	5	8	1	3	12	0.317
31	Abnormal laboratory results	2	9	5	2	2	12	0.026
32	NGT insertion	1	7	8	0	2	14	0.068
33	IV access	1	6	9	1	2	13	0.257
34	Pathology	0	6	10	0	3	13	0.500
	Frequency	291	147	106	263	127	154	0.003

TABLE 2. Summary of Resident versus Attending Choices

Choices	p Value	Significant
"1" vs "2"	0.702	No
"1" vs "3"	0.002	Yes
"2" vs "3"	0.003	Yes

answering service and leave a message" refers to not directly speaking with an attending but relaying a message via their service and does not require a call back from the attending. The form also indicated whether the physician was an attending or resident and the post-graduate year level. We also asked the physicians to suggest additional clinical circumstances that we might have included in the survey.

We compared the frequency of responses of residents and attendings using chi-square and tallied the most common reasons in each category. Each reason was evaluated, and then the different answers were compared.

Data were analyzed using Winks Statistical Data Analysis Software, 6th Edition (TexaSoft, Cedar Hill, Texas). The chi-square test was used. If any number in a cell was 5 or less, the 2-tailed Fisher exact test was applied. In "2 × 2" contingency tables, the Yates factor was employed. Results were considered significantly different at p less than or equal to 0.05. Two sets of 3 answers were given to each of the 34 questions: one set for the attending physicians and the other set for the residents. Initially, the chi-square test was performed on the 2 sets of data to establish significance. Then, pairs of categories were tested to determine any significant difference between the pairs. The data for answer sets 1 and 2 were then combined and compared with the data for answer set 3 (1 + 2 vs 3). In answer sets 1 and 2, the attending was contacted, whereas in answer set 3, he/she was not. This analysis was performed to observe whether any differences in situations regarding any contact versus no contact. Finally, the answers to each question were tested.

TABLE 3. Comparison of "1" and "2" Combined versus "3"

Action Choice	Attending		Resident		p
	"1" and "2"	"3"	"1" and "2"	"3"	
No. Clinical circumstance					
1 Abnormal laboratory results	11	5	4	12	0.078
2 Admission	16	0	16	0	not tested
3 Attorney	8	8	12	4	0.358
4 Card-respiratory arrest	16	0	16	0	not tested
5 Chest pain	15	1	12	4	0.500
6 Consent issue	14	2	11	5	0.500
7 Death	16	0	16	0	not tested
8 Drug reaction	8	8	10	6	0.639
9 Family concern	12	4	11	5	0.500
10 Fever 102	12	4	7	9	0.236
11 Hemodynamic instability	16	0	14	2	0.466
12 NGT insertion	8	8	2	14	0.126
13 Invasive procedure	16	0	16	0	not tested
14 Ischemia	15	1	16	0	not tested
15 Left against medical advice	12	4	15	1	0.500
16 Medication error	12	4	14	2	not tested
17 Myocardial infarction	16	0	16	0	not tested
18 Intravenous access	7	9	3	13	0.352
19 Intubation	16	0	16	0	not tested
20 Restraints	8	8	4	12	0.358
21 Consult	15	1	16	0	not tested
22 Gastrointestinal bleed	16	0	15	1	not tested
23 Wound complication	16	0	16	0	not tested
24 Neurological change	15	1	15	1	not tested
25 Operating room case cancelled	16	0	16	0	not tested
26 Pathology	6	10	3	13	0.500
27 Patient fall	10	6	7	9	0.500
28 Want different attending	15	1	14	2	not tested
29 Positive blood culture	10	6	4	12	1.143
30 Psychiatric concerns	9	7	7	9	not tested
31 Pulmonary embolism	16	0	16	0	not tested
32 Transfer to intensive care unit	16	0	16	0	not tested
33 Transfusion	13	3	9	7	0.352
34 Low urine output	11	5	5	11	0.144
Frequency	438	106	390	154	0.001

RESULTS

Surveys were completed by 16 attendings and 16 surgical residents. A chi-square was performed, which indicated a significant difference ($p = 0.003$) in the answers provided by residents and attendings (Table 1). When we compared the numbers for speaking with the surgeon with leaving a message ("1" vs "2"), no significant difference existed. On the other hand, when comparing speaking with the surgeon with not calling at all ("1" vs "3"), significance was noted ($p = 0.002$). We then compared leaving a message with not calling ("2" vs "3"), and again a statistically significant difference existed ($p = 0.003$) (Table 2).

The data for answers "1" and "2" were then combined and compared with the data for answer "3" ("1" + "2" vs "3") and a significant difference existed, ($p = 0.001$) (Table 3). Overall, 438 attendings and 390 residents chose answers "1" and "2," with a p value of 0.001. In total, 106 attendings and 154 residents answered choice "3," which indicates that residents were less likely overall to call than attendings preferred (Table 4).

When we examined the individual reasons separately, statistically significant differences ($p < 0.05$) existed in regard to notification for "abnormal labs" and "mention of attorney" (Table 1). Eleven of 16 attendings would expect a phone call or message for "abnormal labs," but 12 of 16 residents would not call at all. If the word "attorney" was mentioned, 10 of 16 residents felt they should speak to their attending directly. On the contrary, only 3 of 16 of the attendings felt a phone conversation was necessary.

Residents and attendings agreed universally that an attending should be spoken to directly if a patient had a cardiopulmonary arrest or if a patient had died. Four additional categories had almost universal agreement between residents and attendings. These categories were as follows: admission, invasive procedure, pulmonary embolism, and transfer to intensive care unit (Table 1).

At least 75% of residents did not want to "bother" an attending for abnormal laboratory results, NGT insertion, intravenous access, restraints, pathology, or positive blood cultures. The clinical circumstances when most attendings and residents agreed a call was not necessary, choice "3," are listed in Table 1.

We created a "must speak to directly" list (Fig. 2). This list was based on attendings who responded with choice "1," for any clinical circumstance, at least 14 of 16 times (87.5%). We also created a "must at least leave message" list (Fig. 3) of an additional 8 reasons. A clinical circumstance was added to this list if at least 14 of 16 (87.5%) of the attendings chose action

1. Admission
2. Cardio-respiratory arrest
3. Death
4. Hemodynamic instability
5. Invasive procedure
6. Need for intubation
7. New GI bleed
8. New major wound complication
9. Pulmonary embolism
10. Transfer to ICU

FIGURE 2. "Must Speak to Directly" list ($\geq 14/16$ attending's choice "1").

choice "1" or "2." The percentage 87.5 was chosen arbitrarily to represent the majority of attending choices.

DISCUSSION

Our study tried to help standardize communication between surgical residents and attendings. Poor communication accounted for approximately 70% of sentinel events in 2005, according to the Joint Commission on Accreditation of Healthcare Organizations.¹⁵ Resident failure to notify the attending surgeon of critical patient events was the most common communication breakdown.¹⁴ Optimal patient care can be ensured with effective communication between residents and attendings.¹⁶ We assessed a sample of residents and attendings as to the urgency for a resident to contact an attending. Medical residents at the University of Pittsburgh were less likely to call an attending than attendings wanted to be called.¹⁶ This finding suggested a need to lower the resident's threshold for calling attendings.¹⁶ Likewise, at the University of Michigan, residents

1. Chest pain
2. Consent issue
3. Ischemia
4. Myocardial infarction
5. New consult
6. Neurological change
7. OR case cancelled
8. Patient wants different attending

FIGURE 3. "Must at Least Leave a Message" list ($\geq 14/16$ attending's choice "1" or "2").

TABLE 4. Comparison of the Total Frequency of Scoring Values of All Questions

Scoring Value	1	2	3
Attending	291	147	106
Resident	263	127	154

$p = 0.003$ for comparison of all scores of attending versus resident.

were hesitant to call an attending at night because of the anxiety and friction the call may cause.⁴ With a standardized "must speak to directly" list and "must leave message" list, residents may be less uncertain or hesitant to awaken an attending at night. This policy should improve patient care and outcomes by better communication regarding additional intervention. It should also help crystallize resident phone communication skills and help residents prioritize major issues during phone calls. We are not suggesting that clinical circumstances absent from either list are not worth communicating.

Notification of attendings regarding these same clinical circumstances applies to daytime or weekend hours as well. However, during weekday hours, most of our attendings or their partners are accessible within the hospital. Therefore, this survey may best represent nighttime resident-attending communication.

All clinical circumstances were designed to be objective. These clinical circumstances can be used by different specialties with minor revisions. Likewise, these clinical circumstances can be tailored easily to institutional needs. For institutions in which answering services are not available, another form of resident-attending communication may be through e-mail or text messaging.

Two additional clinical circumstances were overlooked, according to attending surgeons. These circumstances were poor pain control and positive radiologic findings. Uncontrolled pain may be an indication of a more significant disease process or of a major complication postoperatively. Radiologic studies are important for the complete evaluation of patients. In retrospect, both circumstances might be included in the "must" list.

From the attending data, a "must speak to directly" list and a "must leave message" list were created (Figs. 2 and 3). If a resident has a question about urgent patient care, the resident should feel comfortable contacting an attending. In reviewing these lists, we identified that the residents agreed with the attendings in 6 of 10 "must speak to directly" clinical circumstances. These differences revealed areas for discussion.

Currently, we are collating these results with our 9-year complication data from our weekly Morbidity & Mortality conference. The objective is to prevent morbidity related to inadequate attending notification. Certainly, "near misses" might be avoided by better communication. Earlier notification might lead to earlier management.

In the future, we will review the resident barriers for not notifying an attending surgeon regarding certain clinical circumstances. Is it because the resident does not feel the information is important or because the resident lacks experience or knowledge? Williams et al⁶ found incomplete or inaccurate reporting of patient status can be a result of an inadequate knowledge base of the resident. Are our residents falsely secure in their knowledge, or do the residents not want to awaken attendings to inform them of a change in patient status? Is a chief resident less inclined to notify an attending because of a greater knowledge base, or would a chief resident call more often because he/she will soon be an attending and prefers to be totally informed? Likewise, a junior resident might call more often because of lack of

experience or confidence. We hope to continue to reduce communication barriers between residents and attending surgeons and to promote closer teamwork. In doing so, the residents will improve their phone conversation skills. When graduating from residency, a surgeon's phone management of a patient's problem is essential to practice.

Our population is too small to analyze by PGY level, but with more survey participants, we can compare different postgraduate levels. Our study is limited because of the number of surgeons surveyed; therefore, differences might be more apparent with larger numbers. We are using these results as a feature of the practice-based medicine and communication competencies. We will include this report as part of resident orientations. A plan to distribute this survey to all surgical residency programs has been initiated.

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