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Something isn't right:

The subtle changes of early deterioration

Using a systems approach to assessment can help you identify common signs and symptoms of a patient's deteriorating condition, leading to appropriate care and improved outcomes.

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Mr. S, 70, was admitted to your medical-surgical unit 3 days ago with a diagnosis of pneumonia. He has a 1-week history of fever, chills, poor appetite, productive cough, and weakness. His past medical history includes being an ex-smoker (he quit 1 year ago, before that he smoked 2 packs a day for 40 years), hypertension controlled by one medication, no previous surgeries, and no allergies.

Yesterday, Mr. S had a cough and some pain with coughing, requiring 2 L of oxygen via nasal cannula to maintain his oxygen saturation at 98%. He was a bit confused, but his vital signs were within normal limits. When you go to introduce yourself and start your assessment today (day 3), you find he's drowsy and lethargic, and he responds with one-word answers or grunts. You note that he's using pursed-lip breathing. You complete a set of vital signs and discover he's febrile (100.2° F [37.9 C]), with a BP of 110/60; heart rate, 90 beats/minute; respiratory rate, 24 breaths/minute; and oxygen saturation, 95% on 2 L of oxygen via nasal cannula.

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The ability to quickly and accurately detect clinical deterioration in a patient is a crucial nursing skill set for safe, quality care. A delay in recognizing the early signs of deterioration can lead to care delays and negative patient outcomes. There are several reasons for delayed recognition of patient deterioration, including gaps in nursing knowledge, communication challenges, and lack of confidence in assessment skills.

In this article, we provide an overview of the early signs and symptoms of patient deterioration using a systems approach to assessment, along with communication tips using the situation, background, assessment recommendation (SBAR) technique.

Why patients deteriorate

Before we begin looking at how to recognize early signs and symptoms of patient deterioration, it's important to increase your awareness of why a patient may deteriorate so you can anticipate which of your patients may be at risk.

The most obvious reason for deterioration is due to the patient's acute condition (the reason he or she was admitted to the hospital). For example, a patient diagnosed with pneumonia may experience respiratory distress or sepsis as a result.

Other reasons why patients deteriorate may be related to their comorbidities (or past medical history). Think of that same patient admitted with pneumonia, who also has a history of heart disease, diabetes, and arthritis. All of these factors affect the patient and may put him or her at greater risk for deteriorating.

A patient's medications are also closely associated with his or her past medical history. Certain medications or drug interactions may worsen a patient's condition, especially if a complete medication history and review isn't completed.

Factors such a patient's age, mobility, nutritional status, and frailty all impact the potential for deterioration by adding additional stress on the body.

One diagnosis, two patients presents two different patients with the same diagnosis. Consider the difference between these two patients. Who are you more concerned about? Both patients are admitted with pneumonia, but Patient B has a higher risk of deteriorating based on her past medical history.

Understanding which of your patients is at greater risk will help you prioritize care and anticipate potential problems. Many of our patients are like Patient B; they're complex and live their daily life in a fine balance of comorbidities. It may not take much for them to quickly decline from what seems to be a simple infection or ailment.

Assessing your patient

There are three common assessment strategies: focused, head-to-toe, and systems.

The focused approach is when you center your assessment on the body system related to the admitting problem or diagnosis. For example, if you have a patient admitted with pneumonia, your assessment would be focused on the respiratory system. Although focus assessments are useful in some situations, it's important to understand that if this approach is used, the subtle clues of deterioration may go unnoticed.

That's why you need to perform a thorough assessment—using a head-to-toe or systems approach—at least once a shift. Reflecting back on Mr. S, if you only complete a respiratory assessment, you may

One diagnosis, two patients

Patient A:
Admitted with pneumonia

- 54-year-old female elementary school teacher
- 135 lb., active
- Past medical history: no previous health conditions
- Medications: daily multivitamin

Patient B:
Admitted with pneumonia

- 75-year-old retired female
- 190 lb, ambulates with a walker
- Past medical history: diabetes, heart disease, arthritis
- Medications: insulin four times daily; aspirin, 80 mg, once a day; metoprolol, 25 mg, once a day; naproxen, 300 mg, three times daily

miss the neurologic clues, such as his confusion and change in level of consciousness (LOC), that are signaling an impending change in his condition. Having a clear understanding of the patient's baseline status is also needed to aid us in recognizing when his or her status has changed.

A useful way to organize your assessment is to utilize a systems approach. Developing a systems approach to assessing patients helps ensure that you don't miss any of the subtle changes that may indicate your patient is starting to deteriorate.

Neurologic

One of the earliest signs that your patient may be deteriorating is a change in his or her LOC. It's important to remember that the change doesn't have to be drastic to be significant. A patient doesn't need to go from alert and orientated to comatose to signal deterioration; sometimes a minor change from orientated to slight confusion is significant enough to indicate a potential issue.

A change in LOC is often one of the most challenging areas to recognize because you don't always have a clear understanding of the patient's baseline status. Listening to the patient's family and friends can provide feedback and clues to the patient's condition. When families tell us that the patient "just isn't himself" or "she seems a little off," take note (see *Delirium vs. dementia*).

You may be tempted to attribute a small change in your patient's neurologic status to being away from home and his or her normal routine, not sleeping well, and taking new medications. These assumptions may be correct; however, subtle changes in neurologic status, such as anxiety, confusion, and restlessness, can also be early signs of hypoxia and may signal an impending deterioration.

When a change in neurologic status is noted, assess the patient using the Glasgow Coma Scale (GCS). Assessing your patient's pupils and their response to light can also provide you with relevant information. Pupils that are both dilated can be a sign of specific drugs (such as atropine), brain injury, or severe hypoxia. Pupils that are small or pinpoint can be a sign of specific drugs (such as morphine) or a brain injury such as a hemorrhagic stroke. Pupils that are unequal in size can be a sign of brain swelling, hemorrhage, or a head injury (such as blunt force trauma or a fall). Pupils that don't react to light generally indicate significant brain injury and poor outcomes.

Stroke is a potential cause for neurologic deterioration. Although abnormal pupil responses may be an indication of stroke, other stroke symptoms include the development of facial droop, arm drift, and abnormal speech. An increase in BP above the patient's baseline can also be an indication of increased intracranial pressure associated with stroke, which may be accompanied by a sudden, severe headache.

Delirium vs. dementia

	Delirium	Dementia
Onset	Acute (hours to days)	Slow (months to years)
Course	Fluctuating	Progressive
Duration	Hours to weeks	Months to years
Consciousness	Altered	Usually clear
Attention span	Impaired	Normal, except in severe dementia
Psychomotor skills	Altered	Often normal
Reversible	Usually reversible	Irreversible

Note: A patient who has a history of dementia can still experience acute delirium.

Cardiovascular

Most of us can recite textbook normal values for vital signs. The challenge lies in looking at the trends over time and recognizing the small changes that may signal early deterioration.

A patient admitted with a heart rate of 65 beats/minute that slowly climbs to 95 beats/minute is still technically within the normal range. However, if you look at the trend over time, a 30-beat increase in the patient's heart rate is quite significant.

Similarly, examining BP trends over hours and days rather than looking at one reading in isolation can provide a bigger picture of what's going on with the patient.

Always remember to reflect back on the patient's baseline. Consider a patient who's normally hypertensive (baseline BP, 160/80) who now has a BP of 120/60. Is this significant? Although the reading may be normal by textbook standards, it may likely be hypotensive for this patient.

Other clues that your patient may be deteriorating include changes in pulse quality (irregular, bounding, weak, or absent), slow or delayed capillary refill, abnormal swelling or edema, dizziness, syncope, nausea, chest pain, and diaphoresis. Monitoring your patient's temperature is also important. High (febrile) or low (hypothermic) values are both signs of possible impending deterioration.

Respiratory

Auscultate your patient by sitting him or her up and listening anteriorly and posteriorly to all lung fields (see *Common breath sounds*). Of course, a thorough respiratory assessment entails more than just listening to your patient's breath sounds; it includes examining his or her airway, breathing, and oxygen requirements, along with assessing skin color (normal, pale, dusky, or cyanotic), chest shape (barrel chest), and LOC (tired, anxious, or confused).

Assessing patients' ability to protect their airway is vital. Ensure that patients have an effective cough, as well as the ability to clear secretions and safely swallow food and liquids. Patients who have difficulty swallowing may be silently aspirating, which puts them at risk for aspiration pneumonia and deterioration. Incorporating your neurologic assessment with the respiratory assessment allows you to evaluate whether your patient has a neurologic reason preventing him or her from protecting the airway.

Another important component of your respiratory assessment is examining the patient's work of breathing. Take note of how your patient is positioned. Is he or she sitting upright, allowing for proper chest expansion? Is your patient leaning over in a forward or tripod position, using accessory muscles? Or is he or she slumped down in

Common breath sounds

Sound	Cause	Characteristics
Crackles	Air passing over secretions	Fine crackles: Occur at the end of inspiration; high-pitched, short, and interrupted Medium crackles: Occur at the middle of inspiration; lower-pitched and moist sounding Coarse crackles: Occur during inspiration; bubbly and not cleared with coughing
Wheezes	Air flowing through a narrowed airway	Wheezing: Heard on both inspiration and expiration; high-pitched and described as a "musical"-like squeaking Stridor: Wheezing that occurs during inspiration, caused by upper airway narrowing/obstruction
Rhonchi	Turbulence (muscular spasm) caused by fluid or mucus in the larger airway	Occurs during inspiration and expiration; low-pitched and loud "snoring" or "gurgling" sounds that are often cleared with coughing
Plural friction rub	Inflamed pleura rubbing together	Heard best during inspiration; dry and "grating" sounds that aren't cleared with coughing

bed, preventing effective breathing? Also observe for retraction of the intercostal muscles, pursed-lip breathing, and nasal flaring—all signs of respiratory distress.

As with the cardiovascular system, look at your patient's trends when assessing his or her respiratory system. For example, a respiratory rate of 12 breaths/minute that climbs to 16 or 20 may be indicative of deterioration. Look at your patient's oxygen saturation in relation to supplemental oxygen therapy. A patient's oxygen saturation remaining at 100% all day may not seem problematic; however, if supplemental oxygen is increasing from room air to 3 L via nasal cannula to 10 L via face mask to maintain 100%, it's quite significant.

Gastrointestinal and renal

When assessing the gastrointestinal system, the presence of nausea, vomiting, diarrhea, or any change in bowel sounds can indicate deterioration. Any new, increasing, or changing pain is also noteworthy. Performing a thorough abdominal assessment helps you recognize potential issues. An abdominal assessment should include visual inspection, auscultation of bowel sounds, and percussion or palpitation of the abdomen.

To visually inspect the abdomen, observe your patient for any guarding or signs of discomfort; look at the abdomen's shape (flat or distended); and check for abnormal movements, lumps or bumps, and any abnormal discoloration (redness or bruising).

When auscultating for bowel sounds, normal bowel sounds should occur every 2 to 5 seconds. Hyperactive bowel sounds occur more frequently and may be an indication of an infectious process that's irritating the intestines. Hypoactive bowel sounds occur less often and may indicate an inflammatory process such as peritonitis. Both hyper- and hypoactive bowel sounds may be an indication of deterioration.

Mr. S's progression

Assessment	Findings	Vital signs
Day 1	• Alert and orientated, tired • Normal capillary refill, dry skin • Decreased breath sounds in his right lower lung field, productive cough • Dark amber urine	• BP: 135/65 • Heart rate: 65 beats/minute • Respiratory rate: 14 breaths/minute • Oxygen saturation: 98% on room air • Temperature: normal • GCS: 15/15
Day 2	• Coughing and complaining of pain with his cough • Asks you if he's had his breakfast yet • You offer to help him to the bathroom, but he declines complaining that he's too tired	• BP: 125/75 • Heart rate: 77 beats/minute • Respiratory rate: 16 breaths/minute • Oxygen saturation: 98% on 2 L via nasal cannula • Temperature: normal • GCS: 14/15
Day 3	• Sitting leaning over his bedside table in a tripod position • Intercostal accessory muscle use and tracheal tug noted; using pursed-lip breathing • Drowsy, lethargic, nodding off frequently, difficult to hold his attention and keep him awake while you're talking to him • Responds in one-word answers or grunts	• BP: 110/60 • Heart rate: 90 beats/minute • Respiratory rate: 24 breaths/minute • Oxygen saturation: 95% on 2 L via nasal cannula • Temperature: 100.2° F (37.9° C) • GCS: 11/15
Day 4	• Hard to rouse, confused • Course crackles throughout all lung fields	• BP: 95/50 • Heart rate: 100 beats/minute • Respiratory rate: 30 breaths/minute • Oxygen saturation: 93% on 4 L via nasal cannula • Temperature: 102.2° F • GCS: 9/14

Percussion can help you assess for tympanic resonance caused by air-filled areas or dull sounds that may be present over solid masses. Keep in mind that if there's inflammation present, percussion may cause the patient pain. Palpation can help identify areas of discomfort or abnormal masses.

The renal system can be a little more challenging to assess. We know that decreasing urine output is a sign of deterioration, but many of our patients are incontinent, making output difficult to monitor. In the patient who's incontinent, examining the incontinence products for frequency of changing, color, and odor or weighing the product may help monitor his or her fluid output. Looking at the patient's lab values (urea, creatinine, and electrolytes) may show a trend toward deterioration.

Communicating your findings

Have you ever said to a colleague, "I know something is wrong, I just don't know what"? Now that you have a better understanding of the subtle changes that may occur in early deterioration, you'll be able to effectively communicate your findings to your patient's healthcare team. Part of communicating your findings is using specific language. Reporting that your patient is cold isn't the same as reporting that he or she is hypothermic, with a temperature of 95.3° F (35.2° C). If in doubt, always explain your assessment findings in as much detail as possible.

Once you've made the decision that your patient is starting to deteriorate, it's important to organize your information in a clear, succinct way. A commonly used communication tool is SBAR, which is designed to provide a standardized structure for sharing information between care providers. The four components of SBAR are: situation (what's happening right now), background (any relevant history), assessment (what you've found, including recent vital signs), and recommendation (what you need). Organizing your communication in this manner ensures that you'll remember to relay all of the important data to get the response you need.

Let's think back to Mr. S and review some of his assessments (see *Mr. S's progression*).

Mr. Smith starts out as a stable patient admitted with pneumonia. Do you find anything alarming about the day 1 assessment? Other than dehydration, as evident by the dark amber urine and dry skin, Mr. S appears stable.

What do you think of the day 2 assessment? Are you worried about Mr. S? By day 2, he's showing subtle signs of deterioration. He's slightly confused (he can't remember if he ate breakfast); is more tired (he doesn't want to get out of bed); and has changes in his BP, heart rate, and respiratory rate.

On day 3, Mr. S is showing more advanced signs of deterioration. He's lethargic, with an altered LOC, and has increased work of breathing. What do you notice about his trending vital signs?

By day 4, Mr. S is showing advanced signs of deterioration. He's now hard to rouse, confused, and has course crackles throughout all lung fields. His vital signs are also drastically different compared with his baseline.

As the nurse caring for Mr. S, it's important to inform his healthcare provider of his change in status as soon as possible. Using the SBAR acronym, you can clearly and concisely present the relevant data (see SBAR for Mr. S's day 3 assessment findings*).*

Other important factors to remember when reporting a patient's deterioration to the physician or care team include the last time the patient was observed well, any medications given recently that may be impacting his current status, and any

SBAR for Mr. S's day 3 assessment findings

S **Situation:** Dr. X, this is Nurse J calling from the medical-surgical unit. I'm calling about your patient Mr. S. He's deteriorating.

B **Background:** Mr. S was admitted 3 days ago with pneumonia. His only history is hypertension.

A **Assessment:** Mr. S has an altered LOC. He's confused, drowsy, and lethargic. His GCS is 11. His heart rate has increased from 65 to 90 beats/minute. His respiratory rate has increased from 14 to 24, and he has increasing oxygen requirements. He's now on 2 L of oxygen via nasal cannula to maintain his oxygen saturation at 95%. He's febrile, with a temperature of 100.2° F. His BP has dropped from his baseline to 110/60.

R **Recommendation:** I'm concerned that Mr. S is deteriorating. I need you to come to see him right away.

recent lab values or other diagnostics tests completed.

To the rescue

The ability to quickly and accurately detect subtle changes in your patient's condition aids in early identification of deterioration, leading to improved patient outcomes. As discussed, using a systems approach to assessment can help you determine the common signs and symptoms experienced by deteriorating patients. Through communication of your findings using the SBAR technique, you'll be able to intervene and provide timely care to your patients. ■

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