



“Listing” and “identifying” are basic skills. M4 students should be able to DO SOMETHING with that information. Rewording these to higher order objectives, we get:

- **Compare and contrast** the 4 components of general anesthesia – unconsciousness, analgesia, amnesia, akinesia. (*comprehension or analysis*)
- **Create** a treatment plan for patients with pneumonia. (*application*)

You may ask a more junior student to list and identify, but M4 students need a deeper understanding to accomplish these higher-order tasks.

## Objectives should be clear to students and evaluators

Let’s start with some unclear objectives:

- Understand a variety of radiologic procedures.
- Become familiar with the indications for and complications of common ICU procedures.

How would you know when a student understood the radiologic procedure? How familiar does a student have to be with the indications? And how would you know when they reached that level? Objectives should leave little room for interpretation for the student and evaluator. It should be obvious to everyone what the student is supposed to do and when the student has successfully achieved that goal.

- Compare and contrast the CT scan and MRI for neurologic imaging.
- Evaluate the risks and benefits of the following ICU procedures: intubation, central line placement...

These are not only discrete events that the student and instructor can easily understand, but also are easy for an evaluator to observe and measure. Using the active verbs makes this easier.

## Objectives should be measurable

Remember the third goal of objectives is that it gives evaluators something to measure.

- Become familiar with a blood gas

How exactly would you know when the student was “familiar with” a blood gas? You can’t grade that. This is not something you can observe and therefore something you cannot measure.

- Interpret a blood gas in the context of a patient scenario

This can easily be assessed on a test, paper case or in clinical practice. (See Appendix I for example assessments based on the Bloom level.)

## ABCD’s: the components of good objectives

Objectives can be made clear by specifying the ABCD’s: *audience* (the student will be able to), *behavior* (what the student should be able to do), *conditions* (the conditions under which they should do it) and *degree* (how well they should be able to do it that we find acceptable).

For example, we should say more than “take a good history and physical.” If we specify the components:

- audience: the M4 student
- behavior: a history and physical

- conditions: in the dermatology clinic
- degree: at the level of an intern (listing the important aspects of the history of skin lesions and describing lesions using proper dermatologic terminology)

Assembling this into an objective we'd get: *By the end of their rotation in Dermatology, the M4 student will be able to take a history and physical in the dermatology clinic listing the important historical aspects of dermatoses and describing lesions using proper dermatologic terminology.*

### **Avoid teacher oriented objectives**

Many of our objectives seem to be written with the instructor as the audience, not the student. For example:

- To enable the student to diagnose and initiate care of asthma, rhinosinusitis, urticaria...
- The student will have exposure to different procedures in the outpatient rehabilitation clinics including botox injections, baclofen pump refills, acupuncture...

The above are things that instructors need to do. These should be reworded to reflect what we want the students to do.

- Diagnose asthma, rhinosinusitis, urticaria...
- Initiate care of asthma, rhinosinusitis, urticaria...
- Discuss which patients in the rehabilitation clinic would benefit from botox injections, baclofen pump refills, acupuncture...

### **Begin with the end in mind**

One trick in formulating good objectives is to ask the question, "what do we want the student to get out of this rotation?" This way we look at bigger objectives instead of tiny details. Completing the phrase "at the end of this rotation, the student will be able to..." usually will result in a good objective.

Remember each objective is a promise to your students. By listing a particular objective, you are stating that they will have the opportunity to learn that material and then will be tested on it. So don't make "manage a scorpion bite" an objective unless that's something your students will get to do. Make it easier for yourself, if you can't deliver on it - don't list it.

Feel free to email me with any questions, criticisms, comments or improvements. Thanks-Rahul (rahul\_patwari@rush.edu).

### **References**

- [http://meded.ucsd.edu/faculty/writing\\_instructional\\_objectives.pdf](http://meded.ucsd.edu/faculty/writing_instructional_objectives.pdf) (Accessed Jan 2013)
- <http://teaching.uncc.edu/articles-books/best-practice-articles/goals-objectives/writing-objectives-using-blooms-taxonomy> (Accessed Jan 2013)
- A long conversation with Rose Suhayda (Dec 2012) - thanks Rose!

**Appendix I: Example Objectives at Different Levels**

LEVEL	EXAMPLE OBJECTIVE	EXAMPLE ACTIVITY	EXAMPLE ASSESSMENT
1: Knowledge	"By the end of this course, the student will be able to recite Newton's three laws of motion."	Have students group up and perform simple experiments to the class showing how one of the laws of motion works.	Use the following question on an exam or homework. "Recite Newton's three laws of motion."
2: Comprehension	"By the end of this course, the student will be able to explain Newton's three laws of motion in his/her own words."	Group students into pairs and have each pair think of words that describe motion. After a few minutes, ask pairs to volunteer some of their descriptions and write these descriptions on the board.	Assign the students to write a simple essay that explains what Newton's laws of motion mean in his/her own words.
3: Application	"By the end of this course, the student will be able to calculate the kinetic energy of a projectile."	After presenting the kinetic energy equation in class, have the students pair off for just a few minutes and practice using it so that they feel comfortable with it before being assessed.	On a test, define a projectile and ask the students to "Calculate the kinetic energy of the projectile."
4: Analysis	"By the end of this course, the student will be able to differentiate between potential and kinetic energy."	Present the students with different situations involving energy and ask the students to categorize the energy as either kinetic or potential then have them explain in detail why they categorized it the way they did, thus breaking down what exactly makes up kinetic and potential energy.	Give the students an assignment that asks them outline the basic principles of kinetic and potential energy. Ask them to point out the differences between the two as well as how they are related.
5: Synthesis	By the end of this section of the course, the student will be able to design an original homework problem dealing with the principle of conservation of energy."	Tie each lecture or discussion to the previous lectures or discussions before it, thus helping the students assemble all the discreet classroom sessions into a unified topic or theory.	Give the students a project in which they must design an original homework problem dealing with the principle of conservation of energy.
6: Evaluation	"By the end of the course, the student will be able to determine whether using conservation of energy or conservation of momentum would be more appropriate for solving a dynamics problem."	Have different groups of students solve the same problem using different methods, then have each group present the pros and cons of the method they chose.	On a test, describe a dynamic system and ask the students which method they would use to solve the problem and why.

**Appendix II: Key Words for Objectives**

**Those that communicate knowledge:**

**Knowledge:**

Cite	draw	name	recite	repeat	tell
Count	identify	point	recognize	select	trace
Define	indicate	quote	record	state	write
Describe	list	read	relate	tabulate	

**Comprehension:**

Associate	contrast	distinguish	extrapolate	predict	translate
Classify	describe	estimate	interpolate	report	
Compare	differentiate	explain	interpret	restate	
Compute	discuss	express	locate	review	

**Application:**

Apply	employ	locate	relate	sketch	
Calculate	examine	operate	report	solve	
Complete	illustrate	order	restate	translate	
Demonstrate	interpolate	practice	review	use	
Dramatize	interpret	predict	schedule	utilize	

**Analysis**

Analyze	criticize	diagram	experiment	inspect	separate
Appraise	debate	differentiate	inventory	summarize	
Contract	detect	distinguish	infer	question	

**Synthesis**

Arrange	construct	formulate	organize	produce	
Assemble	create	generalize	plan	propose	
Collect	design	integrate	prepare	specify	

**Evaluation**

Appraise	critique	evaluate	measure	recommend	select
Assess	determine	grade	rank	revise	test
Choose	estimate	judge	rate	score	

**Those that communicate skills:**

Diagnose	hold	internalize	measure	pass	project
Empathize	integrate	massage	palpate	percuss	

**Those that communicate attitudes:**

Acquire	exemplify	realize	reflect		
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**Verbs to avoid:**

Appreciate	have faith in	know	learn	understand	believe
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