

# Coordination and Orchestration of the Physical Diagnosis Practical Exam

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# Objectives

1. Demonstrate how the relationship between a standardized patient program and the physical diagnosis course can improve training for second year students.
2. Demonstrate how a standardized patient program can help diversify the physical diagnosis exam.
3. Demonstrate how we can challenge medical students to their fullest potential.
4. Demonstrate how a physical diagnosis practical can be coordinated to provide an efficient exam for a large medical school class, while still examining appropriate diagnostic skills.



# Background

- The first and second year of medical school is done in the classroom via lectures.
- Much of the clinical learning occurs during the third and fourth year of medical school.
- The challenge becomes preparing the second year students for that transition into the third year where they are comfortable interacting with patients and performing an accurate physical exam at the same time



# Why is this so Important?

- Due to physical diagnosis didactics , we feel as if the second year students are provided with excellent instruction on how to conduct a physical exam.
- However, they do not feel as comfortable when they have to perform a physical exam in an actual clinical setting.
- Students often feel intimidated when they get into a clinical situation and find that they do not maximize their clinical skills.
- They must be educated in a manner which ensures readiness for an actual patient encounter in an examination room with a patient and know which aspects of the physical examination they should perform.
- This education should also include evaluating the humanistic and empathetic factors students must master in order to be excellent physicians.
- Providing a teaching and testing environment similar to these realistic situations will better prepare students for their future in medicine and for improved performance on the Physical Exam portion of Step 2 of their board exams.

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# Coordination of the Exam

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# Preparing the Students

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# Preparing the Students

- This course uses *Bates' Guide to Physical Examination and History-Taking* as its principle source of information
- Students have access to the Bates textbook and videos online through the school library
- A review session is built into the end of the fall semester, scheduled to take place before the midterm and final practical exams
- All students are provided with a *Key Points* exam guide to study for the exam

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## Key Points On Doctoring II Final Practical

**The format of the exam will be:**

**Side A: 12 minutes for physical exam + 1 minute for feedback from grader**

**Side B: 8 minutes for physical exam + 1 minute for feedback from grader**

**Schedules and additional exam directions will come from the Standardized Patient Laboratory Staff.**

**You will pick a card from three possible cards on each side and will be required to perform the exam requested in the time allotted. Each item on the checklist will be graded on a 2-1-0 scale. Two points will be awarded for each appropriately completed item, one for a partially completed item, and zero for each not completed or inappropriately completed item.**

**All physical exams will require a basic cardiac, pulmonary, abdominal exam, and thoracic and lumbar structural exam:**

**Cardiac – use diaphragm and listen to 4 points anterior chest**

**Pulmonary – Use the diaphragm and listen to 6 points posterior chest**

**Abdominal Exam – Listen, percuss, and palpate 4 quadrants (in that order)**

**Thoracic – palpate thoracic spine for TART, ask about pain/tenderness**

**Additional Graded items from provider relations skills handout:**

**Hand hygiene**

**Appropriate Greeting**

**Appropriate verbal prompts**

**Grooming**

**Attention to Comfort/Safety**

**Preservation of Dignity/Modesty**



## WHAT IS EXPECTED FOR EACH EXAM:

### Head and Neck:

Inspection of head/scalp

Pupillary reaction

Extraocular movement

Accommodation

Inspect/Palpate the Pinnae of ear

Otoscopic exam of the tympanic membrane

Rhine test

Weber test

Inspection of the nose and sinus

Palpate the Maxillary and frontal sinus

Palpate tmj

Examination of the nares

Inspection of the mouth/lips/tongue

use gloves to inspect the inner lips or have the patient show you him/herself

Examination of the mouth and pharynx (use tongue depressor)

Inspection of the neck

Palpate the lymph nodes in the neck:

preauricular

postauricular

occipital

tonsillar

submandibular

submental

anterior cervical

supraclavicular

Inspection and palpation of the thyroid

Assessment of OA for restriction and must ask about tenderness

Palpate and assess for TART and must ask about tenderness of Cervical Spine

Palpate and assess for TART/tenderness of trapezius muscle

Assess CRI in vault hold for a couple cycles (explain that you would normally hold for 30 seconds)



# Preparing the Patients: Recruiting and Training Standardized Patients

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# Recruiting SPs

- Physical endurance
- Easy-going temperament
- Absence of distracting physical features (i.e. excessive weight, scars, etc.)
- Technical skills to operate software and timers



# Standardized Patient Training

- SPs arrive one hour before the exam start time.
- Handout details exam purpose, logistics, rules, and all necessary information. SP staff conduct a 20-minute read-through and answer questions.
- Course Directors are available for consultation and final instructions.
- Additional handouts available for SPs new to software operation and timers.



**STANDARDIZED PATIENT GUIDELINES FOR**  
**On Doctoring II Term Exam**  
**December 2016**

- This is a term examination for second year students** designed to test their capability in performing physical examination of various body regions.
- This exam consists of **two diagnostic challenges**.
  - First station, "Side A"  
Time allowance: 12 minutes (plus an additional one minute for faculty feedback) 2 timers: 12 minute, 13 minute  
Evaluated on: -->Provider relations (interpersonal) skills, brief assessment of heart and lungs  
Plus .....  
→Based on their blind selection from a field of 3 challenge cards, one of the following: head/neck, central nervous system, peripheral nervous system, upper extremity, lower extremity,
  - Second station, "Side B"  
Time allowance 8 minutes (plus an additional one minute for faculty feedback) 2 timers: 8 minute, 9 minute  
Evaluated on: → Provider relations (interpersonal) skills, brief assessment of heart and lungs  
Plus ...  
→ Based on their blind selection from a field of 3 challenge cards, one of the following:  
ophthalmologic (eye/vision) exam, comprehensive cardiac exam, comprehensive pulmonary exam, peripheral vascular, male urogenital
- There is **no role playing** in this encounter. As an SP your job is to
  - Provide a living body on which the students can demonstrate their proficiency. You will be wearing an exam gown.
  - Using mouse clicks on the room computer, start the digital cameras and two digital timers.
  - Remind the student to announce his name for the camera once the cameras are turned on.
  - Make sure 3 challenge cards are displayed at all times.
  - Neatly fold the cloth drape so that it is neatly displayed for the next student.
- The faculty evaluators will be in the room with** you rather than observing through the glass. This is to ensure that they can have an unobstructed view of the student and be available to provide one minute of feedback.
- Students have been reminded of the importance of hand hygiene and should **perform hand hygiene according to RowanSOM-Kennedy protocol upon entering and exiting the exam room**. However, you are not grading them; faculty are doing all of the grading.
- There are **no overhead announcements** today, and each room is being timed individually by a digital timer installed on your room computer. You will be the one starting the digital timer with your mouse clicks. When the first timer sounds, the student must complete his activity. When the second timer sounds, the faculty must conclude his feedback and the student must exit the room. Please alert one of the program assistants if a faculty evaluator is exceeding the one minute of feedback. We are very tightly scheduled, and we will run behind if the schedule is not strictly followed.
- To summarize and further explain, **this is the sequence that is followed**. Students have already been informed of this, but they will forget and will benefit from your instruction
  - Student arrives at the suite and enters the Orientation Room,. If student lacks a picture ID, student is given a label on which his/her name is block printed. A program assistant is stationed in this room to monitor this check-in and control the flow of students out to the hallway outside of the break room (Hallway B). NO TALKING is permitted.
  - A program assistant stationed at the corner of Hallway D (window wall) and Hallway B directs the flow of students into Exam Rooms 6-10 for the student's first challenge. Student is sent into first available room.



# Execution of the Exam

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# Exam Design

- There are two sides of the practical exam
- Side A is 12 minutes and Side B is 8 minutes
  - Side A has more extensive physical exams :
    - HEENT, Central Neuro, Peripheral Neuro, Upper Extremity, Lower Extremity, Female Exam (breast/pelvic)
  - Side B has shorter exams
    - Cardiology, Pulmonology, Abdominal, Peripheral Vascular, Ophtho, Male GU
- A Physician Grader is present in the room with students for exam
- Each side has 1 minute for formative feedback from the grader



# Scheduling the Exam

- SP facility has 10 exam rooms → 10 faculty evaluators
- 6 rooms for longer Station A, 4 rooms for shorter Station B with option to “flex” one or two rooms to address backups of students waiting for B.
- Students take a one-way trip through exam – all students start with longer Station A, progress to waiting area, then to Station B, then leave the Standardized Patient suite.
- Scheduling is based on longer side A: 12 min challenge + 1 min feedback + 3 min for transition in/out of room = 16 minute interval.
- Students arrive 6 at time (one for each Side A spot) every 16 minutes.
- Student randomly sent into first available room at each station. Randomizes assignment to the faculty evaluator and allows each room to operate independently rather than being tied to centralized timing.



**On Doctoring II Final Clinical Exam Activity Flow**

**Orientation Room:  
Student  
arrival/checkin**

**Waiting area for  
Station A: Student  
sent to first open  
Station A**

**Station A Room: Student self identifies; performs hand hygiene, selects challenge card, performs. SP turns on/off cameras and digital timer, provides a living body. Faculty evaluator grades and provides verbal feedback.**  
**New student every 16 minutes**

**Challenge cards  
swapped in/out  
at intervals to  
further  
randomize.**

**Waiting area for  
Station B: Student  
sent to first open  
Station B**

**Students leave.**

**Station B Room: Same as  
Station A.**  
**New student every 11  
minutes**

# Scheduling the Students

- Student arrival times – 10 minutes before scheduled start time
- Lunch scheduled to give faculty and SPs a rest.
- Students self-select their appointment slots online through a scheduling utility included in the SP program's data capture software, CAE Healthcare's LearningSpace
- All scheduling is done through the software. The paper version is converted into a hard copy for purposes of in-exam convenience.
- Copies distributed to faculty so that they can track progress through the exam.
- When faculty are asked to write their names on the schedule and mark off their **evaluates**, this creates any easy reference to who graded which students.



**On Doctoring II Clinical Exam -12/07/16****8:45 am – 4:51 pm**

Program Assistants: Mark room into which student is sent.

Arrival time	Start time							
8:20 AM	8:30 AM	TB	JM	EP	UP	PT	MV	
8:36 AM	8:46 AM	CC	ME	MH	JL	AN	GS	
8:52 AM	9:02 AM	YH	CL	SM	MS	MI	MS	
9:08 AM	9:18 AM	NA	MB	SB	JI	GK	RK	
9:23 AM	9:33 AM	MK	KR	AS	HT	AW	AW	
9:39 AM	9:49 AM	JC	SK	SM	MN	KO	MY	
9:55 AM	10:05 AM	JC	AI	DS	DK	JS	CW	
10:11 AM	10:21 AM	JF	AK	DM	VR	AR	BS	
10:27 AM	10:37 AM	SD	DF	KJ	SM	NP	NS	
10:43 AM	10:53 AM	KK	HA	AA	DO	PP	JZ	
10:59 AM	11:09 AM	KP	SB	EK	EW	PJ	RP	
11:15 AM	11:25 AM	MC	AH	GH	PP	PS	PS	
11:31 AM	11:41 AM	SG	AH	RH	PK	OQ	BS	
11:47 AM	11:57 AM	SB	SK	CM	DP	SP	SR	
<b>12:10 PM</b>		<i>Lunch: Resume at 1:05 PM</i>						
12:57 PM	1:07 PM	MB	KS	RI	SK	CP	NS	
1:13 PM	1:23 PM	AC	EF	YJ	OP	RL	TR	
1:29 PM	1:39 PM	QB	GC	MD	BV	VG	JS	
1:45 PM	1:55 PM	JA	BG	TT	OI	PP	JP	
2:01 PM	2:11 PM	TB	HU	RE	WS	FY	MS	
2:17 PM	2:27 PM	RA	IK	WS	SR	JU	DV	
2:33 PM	2:43 PM	MB	LL	QA	RG	MK	RZ	
2:49 PM	2:59 PM	TA	PL	ED	HU	HG	ER	
3:05 PM	3:15 PM	KC	OK	RF	LI	FT	JZ	
3:21 PM	3:31 PM	ZZ	UL	TG	FO	MP	SS	
3:37 PM	3:47 PM	SE	TF	YH	CC	JK	RS	
3:53 PM	4:03 PM	FG	RB	UK	JJ	UO	ZK	
4:09 PM	4:19 PM	HI	TD	OL	NJ	TN	MS	
4:25 PM	4:35 PM	AB	LH	PL	TI	PP	LS	

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# Challenge Cards

Patient presents with complaint of sinus pressure, headache and ear pain for one week.

BP = 130/80 mm Hg  
Heart Rate = 90 bpm  
Respiration = 16/min  
Temp = 99.9°F  
Pulse ox = 98%

Perform a complete head and neck exam.

Patient presents with complaint of headache and dizziness for one month. Denies nausea or vomiting. Denies blurry vision.

BP = 150/90 mm Hg  
Heart Rate = 80 bpm  
Respiration = 12/min  
Temp = 97.5°F  
Pulse ox = 99%

Perform a complete exam of the central nervous system

Patient presents with complaint of numbness and tingling in both feet for six months. Patient has history of high blood pressure and diabetes.

BP = 160/95 mm Hg  
Heart Rate = 90 bpm  
Respiration = 14/min  
Temp = 98.0°F  
Pulse ox = 97%

Perform a complete exam of the peripheral nervous system.

Patient presents with complaint of left shoulder and left wrist pain for two months. States that it started after tripping and falling onto the floor directly onto the affected shoulder.

BP = 135/85 mm Hg  
Heart Rate = 80 bpm  
Respiration = 16/min  
Temp = 98.7°F  
Pulse ox = 99%

Perform a bilateral complete shoulder and wrist exam.



**ON DOC II**  
**A**

Patient presents with complaint of right knee pain for one week after twisting it while playing outside with a young relative. States knee locks and feels like it gives out.

BP = 125/80 mm Hg  
Heart Rate = 74 bpm  
Respiration = 14/min  
Temp = 97.5°F  
Pulse ox = 99%

Perform a complete bilateral knee and ankle exam.

Patient presents with complaint of chest pain for one day. Denies radiation of pain. Denies shortness of breath. Denies dizziness.

BP = 140/95 mm Hg  
Heart Rate = 90 bpm  
Respiration = 14/min  
Temp = 98.7°F  
Pulse ox = 98%

Perform a complete cardiac exam.

**ON DOC II**  
**B**

**ON DOC II**  
**A**

**ON DOC II**  
**A**

**ON DOC II**  
**A**

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# Grading Sheets

		COLUMNS (Performance Levels)				
ROWS (Dimensions)		Categories	Done Correctly/Strength Point Value: 2	Done Incorrectly Point Value: 1	Not Done/Opportunity Point Value: 0	Weight
1	Hand Washing Upon Entrance	Categories EPA_1 Provider Relatio... 2.3_Perform_Esse... 2_Patient_Care... Physical_Diagnos... Year_2	Without prompting, performs hand hygiene in accordance with SOM procedure before physically interacting w/ patient. (Off the clock; not part of timed testing.)		Does not perform hand hygiene in accordance with SOM procedure before physically interacting w/ patient. (Off the clock; not part of timed testing.)	2(4.35%)
2	Patient Greeting	Categories EPA_1 Provider Relatio... 4.2_Rapport_Buil... Professionalism 4.1_Communicatio... Physical_Diagnos... Year_2	Greets patient using ALL components: first name, last name, position/title, and/or whose authority, direct eye contact.	Greets patient using SOME components: first name, last name, position/title, under whose authority, direct eye contact.	Does not greet patient	2(4.35%)
3	Grooming	Categories 4.2_Rapport_Buil... EPA_1 Provider Relatio... Professionalism Physical_Diagnos... Year_2	Groomed/dressed appropriately for a patient encounter (clean/roomed, clothing dignified/heat, free of excessive/distracting cosmetics, scents/odors or ornamentation.)		Not groomed/dressed appropriately for a patient encounter (dirty/sloppy, clothing undignified/messy, wearing excessive/distracting cosmetics, scents/odors or ornamentation.)	2(4.35%)
4	Patient Comfort	Categories 4.2_Rapport_Buil... Provider Relatio... EPA_1 Professionalism 4_Interpersonal... Physical_Diagnos... Year_2	Attentive to patient safety/comfort as demonstrated by warming hands/referencing cold hands, avoiding excessive position changes or maneuvers that would cause discomfort or jeopardize patient stability	Somewhat attentive to patient safety/comfort as demonstrated by mildly warming hands/referencing cold hands, slight position changes or maneuvers that cause discomfort or jeopardize patient stability	Not attentive to patient safety/comfort as demonstrated by not warming hands/referencing cold hands, excessive position changes or maneuvers that cause discomfort or jeopardize patient stability	2(4.35%)
5	Patient Modesty	Categories EPA_1 4.2_Rapport_Buil... Provider Relatio... Professionalism 4_Interpersonal... Physical_Diagnos... Year_2	Preserves patient modesty by not needlessly exposing patient and by promptly returning gown to coverage position.	Somewhat preserves patient modesty by needlessly exposing patient and by not returning gown to coverage position.	Does not preserve patient modesty by needlessly exposing patient and by not returning gown to coverage position.	2(4.35%)

Hand Washing Upon Entrance	Interacting w/ patient. (Off the clock; not part of timed testing.)	
Patient Greeting	Greets patient using ALL components: first name, last name, position/title, under whose authority, direct eye contact.	Greets patient using SOME components: first name, last name, position/title, under whose authority, direct eye contact.
Grooming	Groomed/dressed appropriately for a patient encounter (clean/groomed; clothing dignified/neat; free of excessive/distracting cosmetics, scents/odors or ornamentation.)	
Patient Comfort	Attentive to patient safety/comfort as demonstrated by warming hands/referencing cold hands, avoiding excessive position changes or maneuvers that would cause discomfort or jeopardize patient stability	Somewhat attentive to patient safety/comfort as demonstrated by mildly warming hands/referencing cold hands, slight
Patient Modesty	Preserves patient modesty by not needlessly exposing patient and by promptly returning gown to coverage position.	Somewhat preserves patient modesty by needlessly exposing patient and by not returning gown to coverage position
Verbal Prompts	Provides patient with appropriate verbal prompts relating to the exam that the patient can easily follow.	Provides patient with some verbal prompts relating to the exam that may make it difficult for the patient to easily fo
Hand Washing Upon Exit	Without prompting, performs hand hygiene (in accordance with SOM procedure) before exiting.	
Cardiopulmonar Exam: Lungs	Using diaphragm side, auscultates lungs posteriorly at three (3) levels, in a ladder pattern, comparing one side to the other (8 positions)	Does some components of exam, but not all.
Thoracic Exam	Palpates thoracic spine and asks about tenderness.	Palpates thoracic spine but does not ask about tenderness.
Inspection	Done	Done, but not properly.
Checks PMI	Done	Done, but not properly.
Using diaphragm side, auscultates heart at aortic, pulmonic, tricuspid and mitral areas (4 positions)	Done	Done, but not properly.
Using bell side, auscultates heart at aortic, pulmonic tricuspid and mitral areas (4 positions)	Done	Done, but not properly.
Auscultates carotid arteries with bell	Done	Done, but not properly.
Checks for JVD with measurements and head of table raised to 30-60 degrees	Done	Done, but not properly.
Palpation of anterior chest wall including Pec Major and Minor	Done	Done, but not properly.
Assessment of OA for restriction. Must ask about tenderness.	Done	Done, but not properly.
Active ROM for thoracic spine	Done	Done, but not properly.
Passive ROM for thoracic spine. May be completed after Active ROM is fully completed.	Done	Done, but not properly.
Rib assessment - First rib, Upper ribs, middle ribs, lower ribs)	Done	Done, but not properly.
Diaphragm assessment for passive motion. Must ask about tenderness.	Done	Done, but not properly.
Assesses arterial pulse: Radial	Done	Done, but not properly.
Assesses arterial pulse: Ulnar	Done	Done, but not properly.
Assesses arterial pulse: Brachioradialis	Done	Done, but not properly.
Assesses arterial pulse: Aortic	Done	Done, but not properly.
Assesses arterial pulse: Femoral	Done	Done, but not properly.
Assesses arterial pulse: Pretibial	Done	Done, but not properly.
Assesses arterial pulse: Dorsalis Pedis	Done	Done, but not properly.

# Feedback for the students

- Students have 1 minutes after each encounter to receive formative feedback from their grader
- Feedback is meant to give quick review of points on which the student may need to work
- It is not a re-teaching of missed skills
- Positive and reassuring feedback is encouraged, if possible



# Grading

- All grading is completed electronically
- The Physician Grader is in the room while the students are completing their encounter
  - This allows the grader a better view of the actual exam to ensure it is completed properly/appropriately
- The grader completes the checklist during the encounter



# Grading (continued)

- The grading sheet has three possible choices for each item
  - Done correctly
  - Done, but not correctly
  - Not done at all
- All students are required to perform a standard, brief cardiac, pulmonary, and abdominal exam regardless of which card they pull (Just like real life)
- All students are graded on hand washing, grooming, professionalism, maintaining patient modesty and integrity on every encounter

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# Remediation

- Students with a grade of 70% or lower are required to remediate
- Students who had the remediation marked on the grading sheet during the exam will have their video reviewed to see where there was a deficiency
- Remediation must be completed before the start of the next semester
- The student must meet with the course directors and demonstrate the physical exam they failed during the original exam.
- If both sides were not completed appropriately, the student may be required to demonstrate all of the required exams, to ensure students is prepared to advance to clerkship rotations.



# So What Do the Students Think of This?

- Students feel more comfortable interacting with patients
- Students feel more prepared for when they enter an exam room
- Students are able to think on their feet to tailor the physical exam to the patient complaint
- Students have more confidence in their physical exam skills going into the 3rd year clinical rotations.

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# Limitations

- Increasing strain on the Standardized Patient Lab due to more courses examining in a practical setting
- Increasing class sizes are increasing examination times
- Trying to find creative and efficient methods of examining as many systems as possible during a student's tenure in medical school is becoming more challenging and requires additional levels of planning
- 10 physicians out of office hours x 2 days = 40 sessions of lost patient time



# Successes

- Increasing number of students coming back and thanking us for preparing them so well after 3<sup>rd</sup> and 4<sup>th</sup> year clerkship and after PE exam
- The stats: COMLEX PE pass rate increased from prior years after implementing the current examination model for present 4<sup>th</sup> years, who were the first students who were examined in this manner



# References

- (1) Abdulmohson H. Al-Elq. “Simulation-based medical teaching and learning”. *Family Community Med*; 2010, Jan-Apr; 17(1): 35–40.
- (2) Edward Geisbrecht, Pamela F. Wener, Gisele Pereira, “A mixed methods study of student perceptions of using standardized patients for learning and evaluation:”, *Adv Med Educ Pract*. 2014; 5: 241–255.

