ACEP Simulation Case Template		
SIMULATION CASE TITLE: Retinal detachment AUTHORS: Patsy Chenpanas, MD Reviewer: Javier Rosario, MD		
PATIENT NAME: Jane Smith PATIENT AGE: 68 CHIEF COMPLAINT: Vision changes		
Brief narrative description of case Include the presenting patient chief complaint and overall learner goals for this case	68-year-old female presents for acute vision changes. The goals for this case are to apply point-of-care ultrasound to diagnose retinal detachment, to distinguish between emergent versus urgent features of this presentation, and to consult Ophthalmology in an expedited manner.	
Primary Learning Objectives What should the learners gain in terms of knowledge and skill from this case? Use action verbs and utilize Bloom's Taxonomy as a conceptual guide	 Recognize the presenting symptoms of retinal detachment Perform a bedside ocular ultrasound and recognize a macula-off retinal detachment Consult the appropriate service (Ophthalmology) in an efficient manner for definitive treatment 	
Critical Actions List which steps the participants should take to successfully manage the simulated patient. These should be listed as concrete actions that are distinct from the overall learning objectives of the case.	 Physical Exam Visual acuity Slit lamp exam Fundoscopic exam Bedside ocular ultrasound Consult Ophthalmology 	
Learner Preparation What information should the learners be given prior to initiation of the case?	68F with history of myopia, HTN, DM presents with painless acute vision changes.	

Ultrasound	Required Equipment What equipment is necessary for the case?	Snellen chart Fluorescein staining Slit lamp Fundoscope Ultrasound
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INITIAL PRESENTATION			
Initial vital signs	HR: 77 BP: 163/92 RR: 18 O ₂ SAT: 99% on room air T: 37.2 °C		
Overall Appearance What do learners see when they first enter the room?	Elderly female appearing chair.	mildly anxious, but in no a	acute distress, sitting in a
Actors and roles in the room at case start Who is present at the beginning and what is their role? Who may play them?	The patient Her husband (optional)		
HPI Please specify what info here and below must be asked vs what is volunteered by patient or other participants	 68 year old female, in her usual state of health, experiencing acute onset vision changes. She has never had anything like this occur before. (volunteered). Painless (asked) Left eye (asked) Flashes and floaters seen in the upper outer corner (asked) No trauma or injury (asked) No headache (asked) Family history of retinal detachment (asked) No fever, nausea, vomiting (asked) No history of HLD, stroke, TIA, HF, emboli Husband (if present) does not contribute additional meaningful history 		
Past Medical/Surg History	Medications	Allergies	Family History
HTN DM Myopia	Losartan HCTZ Metformin	NDKA	Retinal detachment
Physical Examination			
General	Anxious appearing female	e, sitting in a chair	

HEENT	Normocephalic, atraumatic Pupils equal, round, and reactive Conjunctiva normal No photophobia EOMI, no nystagmus Slit lamp exam: Normal Visual acuity: 20/30 bilaterally Fundoscopic exam: Attempted, difficult exam, not reliable HEENT exam otherwise normal
Neck	Normal
Lungs	Normal
Cardiovascular	Normal
Abdomen	Normal
Neurological	Normal
Skin	Normal
GU	Normal
Psychiatric	Normal

1) SCENARIO STATES, MODIFIERS AND TRIGGERS

2) This section should be a list with detailed description of each step than may happen during the case. If medications are given, what is the response? Do changes occur at certain time points? Should the nurse or other participant prompt the learners at given points? Should new actors or participants enter, and when? Are there specific things the patient will say or do at given times?

PATIENT STATUS	LEARNER ACTIONS, MODIFIERS & TRIGGERS TO MOVE TO THE NEXT STATE	
1. Baseline State Rhythm: NSR HR: 77 BP: 163/92 RR: 18 O₂SAT: 99% on RA T: 37.2 °C	 Learner Actions IV, O2, cardiac monitor Obtain brief history from patient and her husband 	 <u>Modifiers</u> Changes to patient condition based on learner action If eye exam including visual acuity, slit lamp, fundoscopy not attempted, patient complains of worsening vision changes If eye exam attempted, vision changes remain stable If Ophthalmology paged before eye exam or ultrasound, there is no callback If CT requested before eye exam or ultrasound – it will be reported as unavailable (shutdown or busy).

		 For progression to next state Eye Exam
2. Identification of macula-off retinal detachment Rhythm: NSR HR: 79 BP: 165/90 RR: 18 O ₂ SAT: 99% on RA T: °C 37.2	 Bedside ocular US identifies macula-off retinal detachment in LEFT eye 	 <u>Modifiers</u> If bedside ultrasound not attempted on either eye, patient complains of worsening vision changes If bedside ultrasound attempted on either eye, vision changes remain stable However, if bedside ultrasound not performed on both eyes, patient complains of worsening vision changes after scanning single eye If Ophthalmology called after scanning single eye, answering service states a page has been sent. If Ophthalmology called after scanning BOTH eyes, they return your call If CT requested before eye exam or ultrasound – it will be reported as unavailable (shutdown or busy). <u>Triggers</u> Bedside ultrasound of the LEFT eye Bedside ultrasound of both eyes identifying a normal RIGHT eye and a macula-off retinal detachment in the LEFT eye

SUPPORTING DOCUMENTS, LAB RESULTS AND MULTIMEDIA		
Lab Results	CBC shows WBC 7.9/Hgb 12.0/Hct 39.0/platelets 256 BMP: WNL Liver Set: WNL All other labs negative	

EKG	NSR, HR 77, no STEMI or STEMI equivalents
CXR CT imaging	Normal If CT Head/Orbits are attempted, normal
Ultrasound Video Files	Left ocular exam – macula-off retinal detachment Right ocular exam – normal

SAMPLE QUESTIONS FOR DEBRIEFING

- 1) What are risk factors of a retinal detachment?
- 2) What will you see in the case of a bedside ultrasound for a macula on retinal detachment? What about an ultrasound showing macula off retinal detachment?
- 3) Why is it important to determine if the macula is on or off in retinal detachment?
- 4) What is the sensitivity and sensitivity of ocular ultrasound in diagnosing retinal detachment?

Ideal Scenario Flow

Provide a detailed narrative description of the way this case should flow if participants perform in the ideal fashion.

The learners enter the room to find a patient who appears anxious, but is otherwise wellappearing. She is not in any pain, with normal vitals other than an elevated blood pressure. Learners should immediately place the patient on a cardiac monitor and may order 2 large bore IVs to be started. Learners should perform a focused physical exam, and then move to an eye examination. An elderly female with a history of HTN, DM, myopia, painless vision changes, and family history of retinal detachment should prompt an eye exam, followed by a bedside ocular ultrasound as the patient is at high risk of a retinal detachment. If they do not perform the eye exam or the bedside ultrasound, the patient's vision changes will continue to worsen and the nurse should prompt the user by asking if anything else can be done for the patient. If the learners order a CT or consult Ophthalmology before before performing a bedside ultrasound, both will be unavailable.

After the diagnosis of left macula-off retinal detachment is made with bedside US, learners should consult Ophthalmology, who will confirm the diagnosis and discuss operative intervention in a

non-emergent fashion.

In debriefing, facilitators should discuss that the sensitivity and specificity of ocular ultrasound has been shown to be quite good, ranging from 97 to 100% sensitivity, and 83 to 100% specificity in a meta-analysis (Vrablik, et al. 2015). Facilitators of the case should also discuss the differences in sonographic appearance and management between macula-ON and macula-OFF retinal detachment. In macula-ON retinal detachment, the retina is still attached to the macula, which is usually located lateral (or temporal) to the optic nerve. Macula-ON retinal detachment prompts emergent consultation to Ophthalmology for intervention to prevent progression to macular detachment (macula-OFF). In contrast, macula-OFF retinal detachment requires urgent Ophthalmology follow-up. Learners can also discuss differences between vitreous detachment, which does not adhere to the optic nerve and tends to be thinner, and retinal detachment.

Anticipated Management Mistakes

Provide a list of management errors or difficulties that are commonly encountered when using this simulation case.

Numbered list, example below

- 1. <u>Failure to perform an eye exam</u>: It is anticipated that most learners will be tempted to call Ophthalmology right away, but a cursory eye exam (visual acuity, pupils, slit lamp, fundoscopic exam) is required to progress through the case.
- 2. <u>Failure to ultrasound both eyes</u>: Learners will be tempted to ultrasound only one eye and call Ophthalmology right after finding the pathology present in one eye, but performing a bedside ultrasound exam in both eyes is required to progress through the case. Examining both eyes is required to rule out bilateral pathology, and also builds good ultrasound habits (the unaffected eye is recommended to be scanned to use as a comparison).
- 3. <u>Obtaining a CT scan</u>: Some users may be tempted to obtain a CT scan, which is less efficient than performing a point-of-care bedside ultrasound to make the time-sensitive diagnosis.