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# Redefining our Territory: Reaching Pre-Matriculation Students With Case-Based, Online Instruction

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# Redefining our Territory: Reaching Pre-matriculation Students With Case-based, Online Instruction

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## Abstract:

Online educational tools have made it possible for our library to claim some educational territory that was previously unavailable to us, the pre-matriculation period. During the summer of 2015 we were able to add a two-part, case-based, online tutorial to our incoming medical students' pre-matriculation materials. We created the story of Sarah Pilger, a hypothetical, obese, pregnant teenager whose pregnancy is complicated by fetal toxoplasmosis. The case introduces the incoming students to almost all the resources they might want to use while enrolled at UNMC and also introduces students to the roles of the many healthcare professionals who are essential to the care of Sarah and her daughter Emily. Questions are posted throughout the Guide-on-the-Side tutorials and instant feedback is provided. Student response to the 2016 tutorial was overwhelmingly positive. We revised the tutorial for use during the summer of 2017, added pre- and post-tests, and will be able to present results of these tests at meeting time. Our dream is to one day have tutorials for each of UNMC's colleges' entering classes based on Sarah's case, and to use these tutorials to foster inter-professional conversation and education. We have already worked with faculty in UNMC's College of Allied Health Professions to create versions of the tutorial for clinical nutrition and ultrasonography students. The new tutorials are now used as the basis of an inter-professional learning experience in these programs' obstetric units

## Tutorial Storyline, Learning Issues, Resources

When the tutorial was revised for 2016, it was broken into 8 episodes (3-15 minutes each). Links to the Sarah's Baby episodes, the pre- and post-tutorial survey, and the quiz were provided through Blackboard. The quiz questions were identical to the interactive questions in the tutorial episodes. Successful quiz completion was worth 5 points in a fall course.

Step 1. Sarah's Baby (episode 1): Meet Sarah and Pat
Step 2. Required Pre-tutorial Survey
Step 3. Sarah's Baby (episode 2): You Prepare to Meet With Your Attending
Step 4. Sarah's Baby (episode 3): Sarah's Ultrasound
Step 5. Sarah's Baby (episode 4): What's Wrong?
Step 6. Sarah's Baby (episode 5): Treatment
Step 7. Sarah's Baby (episode 6): Prognosis
Step 8. Sarah's Baby (episode 7): Sarah Cries
Step 9. Sarah's Baby (episode 8): Meet Emily
Step 10. Required Post-Tutorial Survey
Required Quiz: Locating Evidence

**Episode 1** - The tutorial, asks that the student pretend that s/he is in the third month of his/her family practice residency and is seeing a new patient, Sarah Pilger, in his/her continuity clinics. Sarah, an obese 16 years old, is accompanied by her mother Pat Pilger. Pat and Sarah first suspected that Sarah was pregnant when Sarah's dentist mentioned that the benign, red, frequently bleeding nodule on Sarah's upper gum was a type of lesion most frequently seen in pregnant women. Sarah had attributed her missed periods to a strict weight reduction diet and exercise regimen started shortly after her LMP. Sarah's exam shows a fundal height of 27 cm. Prenatal vitamins are prescribed. An ultrasound is ordered to determine gestational age. Sarah is referred to a nutritionist for dietary advice and to a physical therapist for back pain.

Other professionals contacted: **Dentist, Nutritionist, Physical therapist**

Learning Issue	Resource
How should a case be presented at attending rounds?	AccessMedicine "advanced search" <i>So You Want to be a Scut Monkey?</i>
What gestational age would be expected to correlate with a 27 cm uterine fundus?	AccessMedicine <i>William's Obstetrics</i>
What are the routine prenatal lab tests?	National Guideline Clearinghouse University of Michigan Health System's Prenatal Care guideline
What red, frequently bleeding nodule on the gums is frequently seen in pregnant women?	VisualDx lobular capillary hemangioma aka pyogenic granuloma

**Episode 3:** The radiologist calls to report Sarah's ultrasound findings. The mild fetal ventriculomegaly, intraparenchymal cerebral calcifications, ascites, and asymmetric growth retardation are consistent with an infection of the fetus and placenta and membranes. She suggests a fetal MRI to verify the ultrasound findings, immediate diagnostic tests on the mothers' blood and perhaps an amniotic fluid test, as, depending on the diagnosis, treatment may be helpful.

Other professionals contacted/mentioned: **Ultrasonographer, Radiologist**

Learning Issue	Resource
What is included in a prenatal ultrasound? How is it performed. What is a biparietal diameter? Why are abdominal circumference and femur length important?	Procedures Consult "Third-trimester Obstetric Ultrasound"

Learning Issue	Resource
Are pregnancy complication rates increased in adolescent pregnancies or in obese mothers?	UpToDate "Pregnancy in Adolescents"
What congenital infections cause intracranial calcifications, ventriculomegaly and ascites?	UpToDate "Overview of TORCH infections"

Sarah's lab work shows high anti-toxoplasmosis IgM and high levels of low avidity, anti-toxoplasmosis IgG.

Other professionals involved: **Medical Technologists, Clinical Pathologists**

Learning Issue	Resource
How are anti-toxoplasmosis lab results interpreted?	MedlinePlus Toxoplasmosis Testing (AACC) UpToDate Toxoplasmosis in immunocompetent hosts

**Episode 5: Treatment**

Other professionals involved: **Infectious Disease Specialist, High-risk Pregnancy Specialist**

Learning Issue	Resource
How is fetal toxoplasmosis treated?	PubMed keyword search with "systematic reviews" limit, Use of "GetIt!@UNMC" buttons to reach full-text, order through McGoogan Docs or search Google Scholar. "Toxoplasmosis in pregnancy." <i>J Obstet Gynaecol Can</i>

**Episode 6:** Sarah asks whether her baby is likely to be blind.

Learning Issue	Resource
How likely is severe eye disease in treated fetal toxoplasmosis?	PubMed MeSH search "Long-term outcome of children with congenital toxoplasmosis" <i>Am J Obstet Gynecol</i> (PMID 20633868).

**Episode 7:** Sarah gives birth to Emily a week after her due date. Emily has mild hydrocephalus and slight motor delays. A shunt is placed. Sarah comes in for an appointment the week after Emily's birth. The nurse who comes in to draw blood after Sarah's appointment finds Sarah crying. She learns that Sarah has been crying frequently, is tired all the time, and has lost interest in most of her activities. A pharmacist suggests that sertraline or paroxetine can be used in breastfeeding women and demonstrates the method for checking for drug interactions with the patient's current meds.

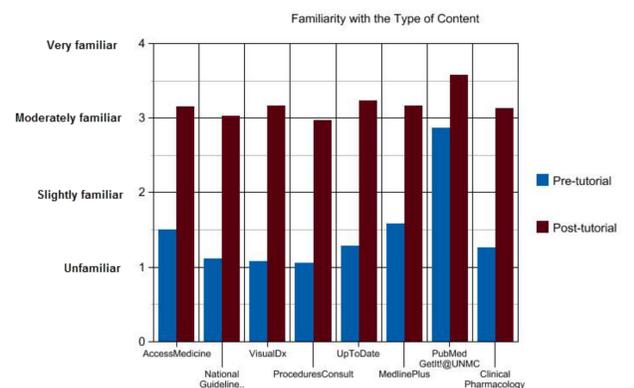
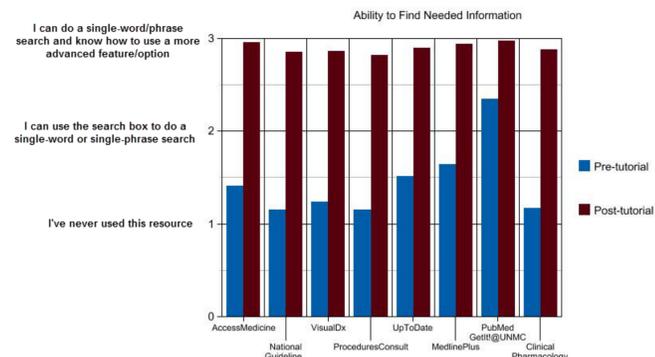
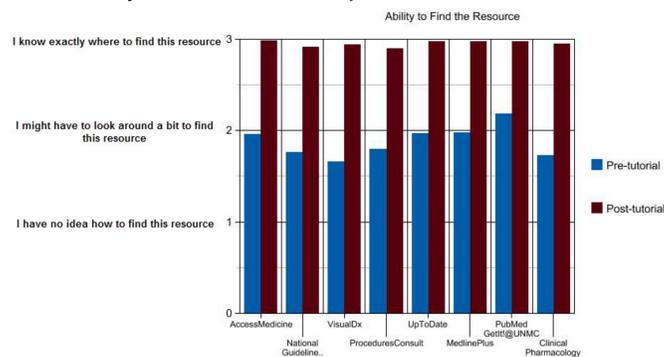
Professionals mentioned: **Nurse, Pharmacist**

Learning Issue	Resource
How is peripartum depression diagnosed?	DMS 5 online "Depressive Disorders" section
Which antidepressants can be used with anti-toxoplasmosis meds	Clinical Pharmacology Drug Interactions report tool

**Episode 8:** Sarah brings Emily in for her 1-year check-up. Emily's physical therapy, occupational therapy, and continued anti-parasitic therapy have produced good results. Emily's psychomotor development is within normal limits. Sarah is doing well with help from her Mom and maternal grandparents. Later that week a friend who went into public health and Sarah's doctor (the tutorial taker) talk about the controversy concerning prenatal toxoplasmosis screening and the prevention and treatment of obesity in adolescents.

Professionals mentioned: **Physical Therapist, Occupational Therapist, Public Health Official**

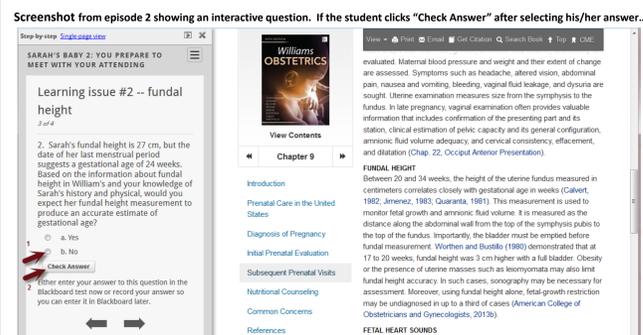
## Pre-Test/Post-Test Results, Student Comments



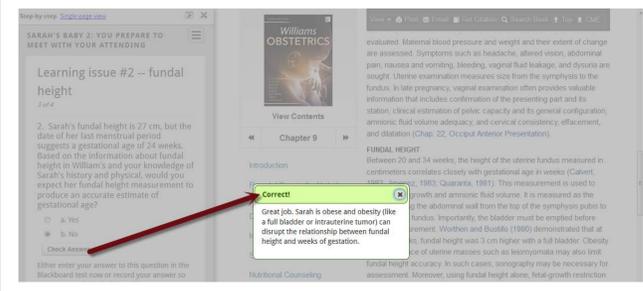
## Building the Tutorial Series

We used a fetal toxoplasmosis case because this allowed us to introduce the new M1s to a wide variety of healthcare professions as well as a wide variety of information resources. After creating a rough outline of the tutorial case we consulted our campus' Interprofessional Education Committee to insure that methods for introducing the various professionals were realistic.

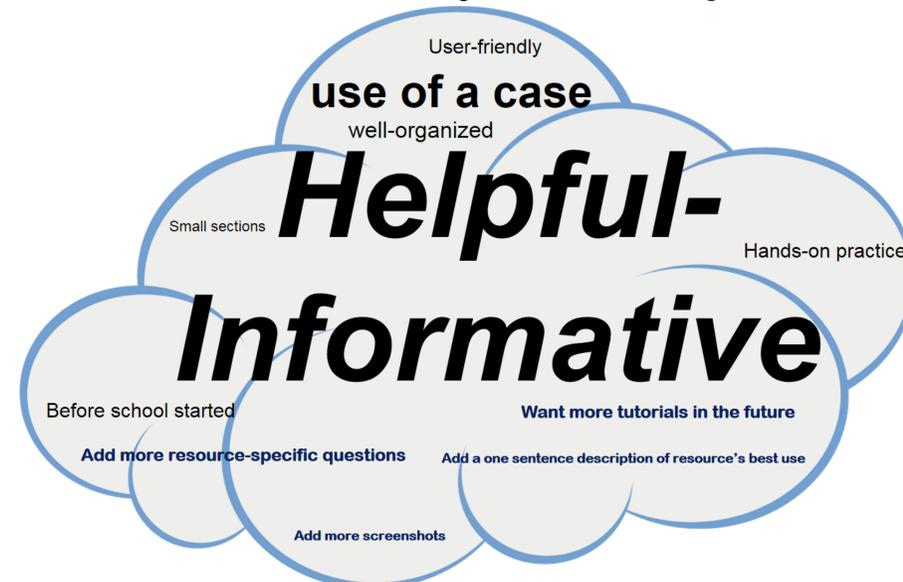
The tutorial was created in Guide-on-the-Side software (freeware from University of Arizona). This software is easy to use, allows for easy insertion of screenshots, linked definitions, and interactive questions (see screenshots below). Guide-on-the-Side also provides for image captions that make the final product ADA compliant.



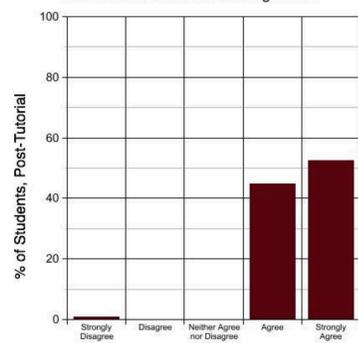
...an immediate feedback pop-up will appear.



## Comment Cloud: Students Liked Certain Things and Wanted Some Changes:



## I am Better Prepared to Use Library Resources to Address Learning Issues



## Conclusions:

The Sarah's Baby tutorials were aimed primarily at increasing students' ability to select an appropriate online resource, find, and search that resource. Post-tutorial survey results show that students felt those aims had been achieved. The tutorial did present Pubmed search tips (the use of Boolean operators, parentheses, quotes, asterisks, filters, and the advanced search page). However, student understanding of the tips was not reinforced with interactive, search-tip-related questions. Survey results showed some improvement in students' PubMed searching facility, but not as much improvement as desired. In the comment section of the post-tutorial survey, several students requested more interactive questions focused on search techniques, and additional questions concerning PubMed search techniques will be added next year.

## References

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