CHATTANOOGA STATE COMMUNITY COLLEGE
CHATTANOOGA, TENNESSEE
DIVISION OF NURSING & ALLIED HEALTH
DIAGNOSTIC MEDICAL SONOGRAPHY PROGRAM

COURSE SYLLABUS

US 213 – Abdomen & Small Parts II

Class Hours:	**4**	**Credit Hours:**	**2**
Laboratory Hours:	**1**		

Semester:	Spring 2011
Dates:	01/18/11-04/26/11, EVERY OTHER Tuesday & 1st Wed. each month
Times:	Class on Tues. 8:30 a.m.–12:00 p.m. / Lab on designated Weds. 8:30 a.m.–12:00 p.m.

Course & Lab Instructor:
Lori Robinson, AS, RDCS, RDMS, RVT, RT(R,CT) — Voice Mail: (423)697-3262
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Office: Chatt. State HPF Building, Office 180
Office Hours: M-F, 8:30 a.m.-5:00 p.m. (unless clinic travel or class)

Additional Lab Instructor:
Jody Arnold Hancock, MAEd, RDMS, RVT, RT(R) — Voice Mail: (423)697-3341
E-Mail: *jody.hancock@chattanoogastate.edu* — Fax No.: (423)697-3324
Office: Chatt. State HPF Building, Office 177
Office Hours: M-F, 8:30 a.m.-5:00 p.m. (unless clinic travel or class)

CATALOG COURSE DESCRIPTION: The second of a three-course sequence; the student will increase knowledge of the abdominal anatomy introduced in US 203. Pathologic patterns of the various organs will be discussed and related to sonographic appearance, physiologic changes, and laboratory findings. Anatomic variations of the organs will be described. The role of Doppler and color-flow techniques in the evaluation of vascular anatomy will be introduced to the student.

ENTRY LEVEL STANDARDS: Successful completion of US 203, as documented by a minimum grade of "C" in the course, as well as proper demonstration of patient care within the clinical environment and good relational abilities between didactical coursework and actual clinical involvement of these principles. The student should demonstrate a responsible attitude toward attendance, independent learning activities, participation, and preparation for classroom material.

In addition, the student should demonstrate a responsible attitude toward attendance, independent learning activities, classroom and clinical participation, and course preparation.

The student should be computer literate and capable of navigating a Web site.

OTHER COURSE REQUIREMENTS: The student should have access to the Internet to gather topic assignments. Networked computers are available for student use on campus, including in the sonography computer laboratory and the library.

Students wishing to become proctored on exams between classes may do so with an approved clinical proctor. This process will require access to a computer with an Internet connection at the clinical facility, as well as the ability to download the Respondus Lockdown browser to access the exam through the Chattanooga State Distributed Education Web site.

PREREQUISITE: US 203, with a minimum grade of "C"

COREQUISITES: US 210, US 211, US 212, and US 215.

TEXTBOOKS & RESOURCES FOR COURSE:

1. Curry, Tempkin (2004). Sonography: An Introduction to Normal Structure and Functional Anatomy, 2nd ed. Philadelphia: W.B. Saunders & Co.
2. Curry, Tempkin (2004). Exercises in Sonographv: An Introduction to Normal Structure and Functional Anatomv, 2nd ed. Philadelphia: W.B. Saunders & Co.
3. Hagen-Ansert, S. (2006). Textbook of Diagnostic Ultrasonographv., Vol. One & Two, 6th ed. St. Louis: Mosby Elsevier.
4. Tempkin, B. (1999). Ultrasound Scanning: Principles and Protocols , 2nd ed. Philadelphia: W.B. Saunders & Co.
5. Hickey, Goldberg (1999). Ultrasound Review of the Abdomen, Male Pelvis & Small Parts. Philadelphia: Lippincott-Raven.

COURSE DELIVERY FORMAT:

Standard Format – This format is the traditional format and may use an online format to provide access to "static" materials which include the syllabus, course material, contact information, and presentations. Faculty must make available when requested a copy of syllabus and any other instructor provided course materials, including their contact information. Faculty may require on-line activities and assignments to include online tests and submission of all written and on-line communications. The extent of on-line activities/assignments may vary by course but will be specified on the syllabus.

PRESENTATION METHODS:

- PowerPoint Presentations
- Reading Assignments
- Learning Objectives
- Case Study Correlation
- Instructor-Led Reviews
- Student-Directed Reviews
- Multimedia / Computer-Directed Aids
- Textbook & Worksheet Exercises – Both Independent Study & Instructor-Led
- Laboratories for Simulations and Practical Clinical Correlation

OUTCOMES & OBJECTIVES

ISLOs - INSTITUTIONAL STUDENT LEVEL OUTCOMES: Specific definitions of each may be found in your Program Handbook. Graduates of the accredited diagnostic medical sonography programs will demonstrate reflective outcomes related to knowledge, skills and attitudes that a community college graduate is expected to develop, to include:

ISLO1. **Effective Communication**
ISLO2. **Critical Thinking and Analytical Skills**
ISLO3. **Information Technology Skills**
ISLO4. **Societal & Cultural Awareness**
ISLO5. **Foundational Knowledge in a Specialty**
ISLO6. **Work Ethic**

PSLOs - PROGRAM STUDENT LEVEL OUTCOMES: This course is offered in conjunction with other pre-requisite and/or co-requisite courses as part of the accredited sonography program. At the end of the program year, the student will demonstrate mastery of the following knowledge, skills, attitudes and/or values as related to all program learning.

PSLO1. Obtain, review, and integrate pertinent patient history and supporting clinical data to facilitate optimum diagnostic results. **(RELATES TO ISLO 5)**

PSLO2. Perform appropriate procedures and record anatomic, pathologic, and/or physiologic data for interpretation by a physician. **(RELATES TO ISLO 5)**

PSLO3. Record, analyze, and process diagnostic data and other pertinent observations made during the procedure for presentation to the interpreting physician. **(RELATES TO ISLO 3)**

PSLO4. Exercise discretion and judgment in the performance of sonographic and/or other diagnostic services. **(RELATES TO ISLO 2)**

PSLO5. Demonstrate appropriate communication skills with patients and colleagues. **(RELATES TO ISLO 1)**

PSLO6. Act in a professional and ethical manner. **(RELATES TO ISLO 6)**

PSLO7. Provide patient education related to medical ultrasound and/or other diagnostic vascular techniques, and promote principles of good health. **(RELATES TO ISLO 4)**

CSLOs - COURSE STUDENT LEVEL OUTCOMES: To be better prepared to interact and function in the sonography department upon course completion, the student will achieve the following course outcomes.

CSLO1. Utilize Doppler and color flow techniques to further evaluate anatomic and pathologic presentations of vascularized structures, relating normal and abnormal sonographic vasculature findings to various hemodynamic disturbances. **(RELATES TO PSLO 2)**

CSLO2. Examine, didactically and sonographically, pathology related to the lymph nodes and other reticuloendothelial structures. **(RELATES TO PSLO 3)**

CSLO3. Apply hepatic pathological processes from the cellular level to sonographic imaging techniques. **(RELATES TO PSLO 4)**

CSLO4. Utilize ultrasound as a primary tool in the evaluation and diagnostic process of biliary tract diseases. **(RELATES TO PSLO 1)**

CSLO5. Detect pancreatic disease processes utilizing knowledge of pathology and sonographic technique. **(RELATES TO PSLO 3)**

CSLO6. Document the usefulness of ultrasound in the evaluation of splenic disease processes. **(RELATES TO PSLO 5)**

CSLO7. Investigate the applications of renal sonography in the evaluation of abnormal urinary tract disorders. **(RELATES TO PSLO 3)**

CSLO8. Relate retroperitoneal fluid collections and abnormalities to the disease processes of the other various organs. **(RELATES TO PSLO 3)**

CSLO9. Consider the effect which anatomical variations have upon the sonographer's portrayal of the organs. **(RELATES TO PSLO 3)**

CSLO10. Develop introductory protocols for superficial structures that will be expanded upon in the third component of the Abdominal/Small Parts learning series.

LEARNING INDICATORS AND OBJECTIVES: These objectives assist in assuring the student will be better prepared to interact and function with instrumentation in the sonography department upon course completion. These learning indicators have also been included, and sometimes expanded upon, within each of the Topic sections of this syllabus, to correlate with assignments for the purpose of focused student comprehension.

LO1. Recognize the sonographic/ Doppler differences in the arterial and venous systems. **(CSLO 1)**

LO2. Identify/assess the major aortic branches, IVC tributaries, and portal venous system components, detailing the organ or organ systems they feed/drain. **(CSLO 1)**

LO3. Diagram and recognize the sonographic appearance of the various types of aortic aneurysms detailing the common clinical symptoms and sonographic characteristics. **(CSLO 1)**

LO4. Recognizing the appearance of high resistant, low resistant and turbulent blood flow, utilize ultrasound and Doppler techniques to assess normal and abnormal vascular flow. **(CSLO 1)**

LO5. Utilizing ultrasound and Doppler techniques assess vascular structures for the presence of tumor, clot, stenosis, dilatation, aneurysms, flow reversal, turbulence and other vascular pathologies describing the sonographic and Doppler wave form appearance, and location of the pathology. **(CSLO 1)**

LO6. Identify the sonographic/Doppler findings associated with Portal Vein Hypertension. **(CSLO 1)**

LO7. Assess the Liver for fatty infiltration recognizing the different grades infiltration and sparing. **(CSLO 3)**

LO8. Describing the sonographic appearance and location, assess the liver for primary, metastatic and benign lesions. **(CSLO 3)**

LO9. Recognize the role of ultrasound and Doppler in the assessment of abdominal disease processes, abdominal trauma, organ infarction, fluid collections, and organ transplant detailing the signs, symptoms, laboratory values, clinical presentation, location, and sonographic appearance of traumatic injury, organ infarction, abnormal fluid collections, and/or transplant rejection. **(CSLO 8)**

LO10. Diagram, describe and/or sonographically assess the Biliary system, gallbladder, and gallbladder wall detailing normal/abnormal anatomic sonographic appearance, laboratory values, and clinical signs and symptoms of pathologies related to these systems. **(CSLO 4)**

LO11. Describe the sonographic appearance of a Courvoisier gallbladder, a Klatskin's tumor, and the "WES" sign. **(CSLO 4)**

LO12. Diagram, describe and/or sonographically assess congenital anomalies, normal variants, and benign processes within the abdomen and abdominal organ systems. **(CSLO 9)**

LO13. Diagram, describe and/or sonographically assess the pancreas detailing normal/abnormal anatomic sonographic appearance, laboratory values, and clinical signs and symptoms of pancreatic pathologies. **(CSLO 5)**

LO14. Diagram, describe and/or sonographically assess the urinary system detailing normal/abnormal anatomic sonographic appearance, laboratory values, and clinical signs and symptoms of renal, ureteral, and bladder pathologies. **(CSLO 7)**

LO15. Diagram, describe and/or sonographically assess the spleen detailing normal/abnormal anatomic sonographic appearance, laboratory values, and clinical signs and symptoms of pathologies related to these systems. **(CSLO 6)**

LO16. Diagram, describe and/or sonographically assess the lymphatic system and other reticuloendothelial structures detailing normal/abnormal anatomic sonographic appearance, laboratory values and clinical signs and symptoms of pathologies related to the lymphatic/ reticuloendothelial system. **(CSLO 2)**

LO17. As an introductory exercise, diagram, describe, and/or assess the thyroid, breasts, and scrotum as structures that are sonographically considered "Small Parts". **(CSLO 10)**

REQUIRED ASSESSMENTS

Syllabus Review	Submit Syllabus Acknowledgement Statement				**ISLO 1**
Laboratory Detail	Fulfillment of Lab Duty Assignment (e.g., Clean up, laundry)				**ISLO 4**
Laboratory 1	Activity 1: Abdominal Review Scan Lab (Completion of Scan Lab Sheet)	**LO 2** **LO 10** **LO 13** **LO 14** **LO 15**	**CSLO 1** **CSLO 4** **CSLO 5** **CSLO 7** **CSLO 6**	**PSLO 2** **PSLO 1** **PSLO 3** **PSLO 5**	**ISLO 5** **ISLO 3** **ISLO 1**
Laboratory 1	Activity 2: Abdominal Review Exam	**LO 2** **LO 10** **LO 13** **LO 14** **LO 15**	**CSLO 1** **CSLO 4** **CSLO 5** **CSLO 7** **CSLO 6**	**PSLO 2** **PSLO 1** **PSLO 3** **PSLO 5**	**ISLO 5** **ISLO 3** **ISLO 1**
Laboratory 1	Activity 3: Clinical Lab Values Post-Test	**LO 10** **LO 13-16**	**CSLO 4** **CSLO 5** **CSLO 7** **CSLO 6** **CSLO 2**	**PSLO 1** **PSLO 3** **PSLO 5**	**ISLO 5** **ISLO 3** **ISLO 1**
Topic 1 Objectives	Part 1 Instructional Objectives in Syllabus (Vascular Pathology)	**LO 1 - 6**	**CSLO 1**	**PSLO 2**	**ISLO 5**
Exam 1	Covers Topics & Materials on: Topic 1: Vascular Pathology	**LO 1 - 6**	**CSLO 1**	**PSLO 2**	**ISLO 5**
Topic 2 Objectives	Part 2 Instructional Objectives in Syllabus (Hepatic Pathology)	**LO 6 – 9** **LO 12**	**CSLO 1** **CSLO 3** **CSLO 8** **CSLO 9**	**PSLO 2** **PSLO 4** **PSLO 3**	**ISLO 5** **ISLO 2** **ISLO 3**
Exam 2	Covers Topics & Materials on: Topic 2: Hepatic Pathology	**LO 6 -9** **LO 12**	**CSLO 1** **CSLO 3** **CSLO 8** **CSLO 9**	**PSLO 2** **PSLO 4** **PSLO 3**	**ISLO 5** **ISLO 2** **ISLO 3**
Topic 3 Objectives	Part 3 Instructional Objectives in Syllabus (Biliary Tract Pathology)	**LO 9** **LO 10** **LO 11** **LO 12**	**CSLO 8** **CSLO 4** **CSLO 9**	**PLSO 3** **PSLO 1**	**ISLO 3** **ISLO 5**
Laboratory 2	Activity 1: Thyroid Scan Lab (Instructor signed lab sheet)	**LO 17**	**CSLO 10**	**PSLO 2**	**ISLO 5**
Laboratory 2	Activity 2: Thyroid Internet Lab (Score Sheet)	**LO 17**	**CSLO 10**	**PSLO 2**	**ISLO 5**
Laboratory 2	Activity 3: Scrotum Internet Lab (Score Sheet)	**LO 17**	**CSLO 10**	**PSLO 2**	**ISLO 5**
Laboratory 2	Activity 4: Thyroid Post-Test (Instructor to Grade)	**LO 17**	**CSLO 10**	**PSLO 2**	**ISLO 5**
Laboratory 2	Activity 5: Scrotum Post-Test (Instructor to Grade)	**LO 17**	**CSLO 10**	**PSLO 2**	**ISLO 5**

Protocol Assignment	Thyroid Protocol Cards (Follow Instructions provided by instructor; graded based on Protocol Card Assessment Tool)	**LO 17**	**CSLO 10**	**PSLO 2**	**ISLO 5**
Protocol Assignment	Scrotum Protocol Cards (Follow Instructions provided by instructor; graded based on Protocol Card Assessment Tool)	**LO 17**	**CSLO 10**	**PSLO 2**	**ISLO 5**
Topic 4 Objectives	Part 4 Instructional Objectives in Syllabus (Pancreatic Pathology)	**LO 9 LO 12 LO 13**	**CSLO 8 CSLO 9 CSLO 5**	**PSLO 3**	**ISLO 3**
Laboratory 3	Activity: Abdominal Scanning Simulation (Biliary, Hepatic & Pancreatic Pathology)	**LO 8 LO 9 LO 10 LO 11 LO 13**	**CSLO 3 CSLO 8 CSLO 4 CSLO 5**	**PSLO 4 PSLO 3 PSLO 1**	**ISLO 2 ISLO 3 ISLO 5**
Exam 3	Covers Topics & Materials on: Topic 3: Biliary Pathology and Topic 4: Pancreatic	**LO 9 LO 10 LO 11 LO 12 LO 13**	**CSLO 8 CSLO 4 CSLO 9 CSLO 5**	**PSLO 3 PSLO 1**	**ISLO 3 ISLO 5**
Topic 5	Part 5 Instructional Objectives in Syllabus (Renal Pathology)	**LO 2 LO 4 LO 5 LO 9 LO 12 LO 14**	**CSLO 1 CSLO 8 CSLO 9 CSLO 7**	**PSLO 2 PSLO 3**	**ISLO 5 ISLO 3**
Laboratory 4	Activity: 1 Abdomen Image Quiz	**LO 2 LO 3 LO 9 -12 LO 14-16**	**CSLO 1 CSLO 8 CSLO 4 CSLO 9 CSLO 7 CSLO 6 CSLO 2**	**PSLO 2 PSLO 3 PSLO 1 PSLO 5**	**ISLO 5 ISLO 3 ISLO 1**
Laboratory 4	Activity: 2 Gallbladder Case Study (Instructor graded answer sheet)	**LO 10 LO 11**	**CSLO 4**	**PSLO 1**	**ISLO 5**
Laboratory 4	Activity: 3 Breast Internet Lab (Score sheet)	**LO 17**	**CSLO 10**	**PSLO 2**	**ISLO 5**
Laboratory 4	Activity: 4 Breast Internet Lab (Score sheet)	**LO 17**	**CSLO 10**	**PSLO 2**	**ISLO 5**
Laboratory 4	Activity 5: Abdominal Scanning Simulation (Biliary & Pancreatic Pathology)	**LO 9 LO 10 LO 11 LO 13**	**CSLO 8 CSLO 4 CSLO 5**	**PSLO 3 PSLO 1**	**ISLO 3 ISLO 5**
Protocol Assignment	Breast Protocol Cards (Follow Instructions provided by instructor; graded based on Protocol Card Assessment Tool)	**LO 17**	**CSLO 10**	**PSLO 2**	**ISLO 5**

Exam 4	Covers Topics & Materials on: Topic 5: Renal Pathology	LO 2 LO 4 LO 5 LO 9 LO 12 LO 14	CSLO 1 CSLO 8 CSLO 9 CSLO 7	PSLO 2 PSLO 3	ISLO 5 ISLO 3
Topic 6 Objectives	Part 6 Instructional Objectives in Syllabus (Splenic Pathology)	LO 5 LO 9 LO 12 LO 15	CSLO 1 CSLO 8 CSLO 9 CSLO 6	PSLO 2 PSLO 3 PSLO 5	ISLO 5 ISLO 3 ISLO 1
Topic 7 Objectives	Part 7 Instructional Objectives in Syllabus (Reticuloendothelial Pathology)	LO 5 LO 9 LO 16	CSLO 1 CSLO 8 CSLO 2	PSLO 2 PSLO 3	ISLO 5 ISLO 3
Topic 8 Objectives	Part 8 Instructional Objectives in Syllabus (Other Retroperitoneal abnormalities)	LO 9	CSLO 8	PSLO 3	ISLO 3
Laboratory 5	Activity: Case Study Presentation	LO 1 LO 3 LO 5 -16	CSLO 1 - 9	PSLO 1-5	ISLO 2-6
Exam 5	Comprehensive Final Covers Topics & Materials on: Topics 1-8	LO 1-17	CSLO 1-10	PSLO 1-5	ISLO 2-6

EXAMS:

- Five(5) Non-Cumulative objective exams –70% of final course grade.
  - Each exam will be 14% of the final course grade.
  - All exam scores, however, MUST be passing (70% or higher) /or/ remediation will be expected.*
- Note that the Final Exam is NOT comprehensive (although all materials comprehensively build upon one another throughout the semester). The final exam is the 5th non-cumulative exam.

*Remediation of an exam must take place if the student does not pass the exam with a score of 70% or greater. The policy of the CSTCC DMS program is to allow remediation of one(1) non-cumulative exam per course. This means that:

- When a final exam is cumulative/comprehensive, it is not eligible for remediation. (The student must pass with a minimum score of 70% to progress to the next course or to complete the program if the course exists in the final semester.)
- If a student has already remediated an exam during this same course, the student is no longer eligible for additional remediation within the specified course. (Students will continue to be eligible for a one-time remediation within another course during the same semester, however.)
- When sitting for a remediation exam, the student is expected to achieve a minimum score of 80% in order to progress to the next course or to complete the program if the course exists in the final semester.
- Although the student is allowed the opportunity for remediation for the sake of progression, the student's original exam grade will be posted for final grade calculation purposes.

Students who do not pass the remediation attempt with a minimum score of 80%, or students who have already remediated and do not achieve a minimum score of 70% on a following examination will not be allowed to progress in the course or program. Such students will have the opportunity to apply for readmission to the program during the following program year.

LABORATORY EXPECTATIONS:

1. Demonstrations/Simulations, where applicable. Laboratories will be conducted to correspond with presentations, protocols and homework assignments.
2. Each student will create and maintain a protocol booklet of images for procedures (Small parts: thyroid & scrotal protocol) to be introduced during the semester, which will count towards 3% of the final grade.
3. Scanning/simulation participation and multimedia assignments will be graded for a portion of the laboratory grade, which consists as 15% of the student's final grade.

FIELD WORK:

Clinical correlation should be made to all instructional learning, with clinical assignments often given as or related to homework throughout the program. Students may be asked to present cases or bring case information into the classroom setting. HIPAA Regulations must be adhered to in such instances, with the **HIPAA Privacy Statement** submitted with the case, and the **Case Rubric** utilized if a full case is assigned by the instructor. These forms are located in your Syllabus following the Syllabus Acknowledgement Statement.

For this semester, you will be assigned a Abdominal Abnormality case work-up in this course. You may NOT use it for your clinical case study in US 213 this semester. It should be completed and presented as a class assignment only. You must bring the case for this course to your class session with you. This is part of your laboratory grade.

OBJECTIVES:

Students will be expected to perform objectives located within the topic overviews for each section *INDEPENDENTLY*, in addition to other chapter objectives that may also be assigned. These objectives will be turned in prior to each exam that correlates to this material in the student's dropbox (either online or on campus).

Objectives completion directly assists in preparing the student for the assessment on related material, so these MUST be completed. The student should consider these as the "Entrance Ticket" to your exam. The instructor reserves the right to refuse the student entrance to the exam without first submitting these objectives.

Note that the student should preferably use the online dropbox and only use the on-campus one if online submission is not available or achievable. (The student should choose only one means or the other of submission; do not duplicate assignment submission into both places, please.)

OTHER EVALUATION METHODS:

Attendance and Participation will be taken into consideration when assigning the final grade, with points being deducted for unexcused absenteeism or tardiness. The instructor reserves the right to adjust grades according to these or other considerations (i.e. participation, disruption, etc.).

Attendance and other relevant classroom policies are specifically addressed in the DMS Student Handbook, where the student has previously given signature to an understanding and acceptance of these policies.

COURSE GRADING & GRADING SCALE:

EXAM 1	14%
EXAM 2	14%
EXAM 3	14%
EXAM 4	14%
EXAM 5	14%
LABORATORIES	15%
PROTOCOL CARDS	3%
OBJECTIVES COMPLETION	12%

The final grades of A, B, C, D, or F will be assigned on the basis of the numerical average determined by the assignments listed above with the following point ranges:

A	(90-100)
B	(80-89)
C	(70-79)
D	(65-69)
F	(64 or less)

In the event that a student fails an exam and has exhausted all remediation attempts, the student will NOT be awarded a grade higher than a D, regardless of how the numeric grade would otherwise calculate. Students must successfully complete all work with passing competency grades for each assignment to achieve a minimum of a C in the course, thereby maintaining eligibility for program progression.

SYLLABUS STATEMENTS

STUDENT-INSTRUCTOR COMMUNICATION

All sonography program students are required to set up a TigerMail account and supply this official college email address to the program director at the beginning of the program year. Your director and/or instructor will use your TigerMail account to relay any *program-specific* information to you. The link to set up this account can be found on the campus TigerWeb home page, which will first require input of your Student campus ID (your "A" number) and setting up your own password.

Any email communications that are *course-specific* will be addressed by your instructor through the e-Learn (online course platform) email system. Your instructor(s) will demonstrate the use of this tool during your sonography orientation. Please utilize the e-Learn email system within your course when asking a *course-specific* question or submitting *course-specific* information to your instructor.

You may email your instructor at his/her Chattanooga State email address (rather than the e-Learn site) or call and leave a message on your instructor's voice mail when your question or information is either program-specific or your course-specific question has not been answered according to the procedure established in the following paragraph.

It is my goal, as your sonography course instructor, to answer your emails and voice mails within 48 hours during the regular program week (Mon-Fri) and within 72 hours when a weekend is involved. However, please understand that the sonography program requires faculty to travel to clinic sites and other professional events (often for multiple consecutive days) as part of my program duties. I will continue to make reasonable attempts to check my email and/or voice mail within the stipulated timeframe above. However, in an emergency where you have not received an adequate response in a timely manner, please leave a message with our secretary at 423-697-3360, specifically explaining your need, so that she may attempt to reach me or someone else who can assist you immediately. Thank you.

ASSIGNMENT GRADING

Students are asked to submit graded documents either within their Dropbox (online) or Inbox (on campus) by the designated due date. Your instructor will have submitted items graded no later than the following class week, where you will either receive confirmation of a grade in your Dropbox Comments (online) or your graded materials will be located in your Outbox (on campus). Your instructor will notify you of any grading delays beyond this standard, along with the anticipated time you may expect to receive your returned graded assignment.

Where instructor dates are provided (on the course online calendar, syllabus, lesson plans and/or in each topic segment), late work will be accepted only under extenuating circumstances and upon completion and submission

of the Extension Request Form together with explanation and proof of need for an extension (i.e. doctors certificate, etc.). All accepted late assessment, regardless of cause, may be penalized.

If the course is not completed prior to the end of the term, the student will receive an Incomplete and will have two additional weeks into the following semester to complete the course work (unless the instructor has approved a later date in advance, due to approval of the extension request form). After such time, an Incomplete will be changed to a Failure of the course.

EXTENSION POLICY

Assignments will not be accepted after 2 weeks from the end of the assigned course week. Late assignments can only receive a maximum of 75% of the grade assigned. (Extreme extenuating circumstances, such as a health issue, may receive special consideration.)

ADA STATEMENT

Students who have educational, psychological, and/or physical disabilities may be eligible for accommodations that provide equal access to educational programs and activities at Chattanooga State. These students should notify the instructor immediately, and should contact Disabilities Support Services within the first two weeks of the semester in order to discuss individual needs. The student must provide documentation of the disability so that reasonable accommodations can be requested in a timely manner. All students are expected to fulfill essential course requirements in order to receive a passing grade in a class, with or without reasonable accommodations.

DISRUPTIVE STUDENTS

The term “classroom disruption” means – student behavior that a reasonable person would view as substantially or repeatedly interfering with the activities of a class. A student who persists in disrupting a class will be directed by the faculty member to leave the classroom for the remainder of the class period. The student will be told the reason(s) for such action and given an opportunity to discuss the matter with the faculty member as soon as practical. The faculty member will promptly consult with the division dean and the college judicial officer. If a disruption is serious, and other reasonable measures have failed, the class may be adjourned, and the campus police summoned. Unauthorized use of any electronic device constitutes a disturbance. Also, if a student is concerned about the conduct of another student, he or she should please see the teacher, department head, or division dean.

AFFIRMATIVE ACTION

Students who feel that he or she has not received equal access to educational programming should contact the college affirmative action officer.

ACADEMIC INTEGRITY/ACADEMIC HONESTY

In their academic activities, students are expected to maintain high standards of honesty and integrity. Academic dishonesty is prohibited. Such conduct includes, but is not limited to, an attempt by one or more students to use unauthorized information in the taking of an exam, to submit as one's own work, themes, reports, drawings, laboratory notes, computer programs, or other products prepared by another person, or to knowingly assist another student in obtaining or using unauthorized materials. Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students guilty of academic misconduct, either directly or indirectly through participation or assistance, are immediately responsible to the instructor of the class. In addition to other possible disciplinary sanctions, which may be imposed through the regular institutional procedures as a result of academic misconduct, the instructor has the authority to assign an "F" or zero for an activity or to assign an "F" for the course.

SYLLABUS GUIDELINES STATEMENT

The instructor reserves the right to modify this syllabus in writing anytime during the course of the semester.

This course is governed by the policies and procedures as stated in the current:

- Chattanooga State Student Handbook
- CSTCC Nursing/Allied Health Student Handbook
- CSTCC Diagnostic Medical Sonography Student Handbook.

Additional or more specific guidelines may apply.

PROGRAM POLICIES: This class is governed by the policies and procedures stated in the current Chattanooga State Diagnostic Medical Sonography Student Handbook. Additional or more specific guidelines may apply.

COLLEGE POLICIES: This class is governed by the policies and procedures stated in the current Chattanooga State Student Handbook. Additional or more specific guidelines may apply.

STUDENT ACKNOWLEDGEMENT STATEMENT

By my signature below, I attest that I have received and reviewed the ____US 213____ course syllabus for ___Spring___ _____ .
(course no.)
(Semester) (Year)

I understand the course requirements with regard to attendance, grading, objectives, course policies and procedures, including those regarding my conduct in this course. I agree to be held accountable for my performance and actions according to such requirements and also agree to the provisions of the *Syllabus Guidelines Statement* as written within the course syllabus.

Student Name (Please Print):_____

Student Signature:_____ Date:_____

Chattanooga State Community College Diagnostic Medical Sonography Program
HIPAA Privacy Statement Related to Sharing of Case Study Information for Educational Purposes

Course #:_____Semester/Year: _____

Case Study Title:_____

Case Study #: _____Instructor:_____

The submitted archived images/reports associated with this case study are to be used only by the ChSCC DMS/CVS Programs for case study information, according to the current HIPAA agreement that has been signed by all relevant parties. No portion is to be shared for any other purpose outside of the agreed upon scope to pursue academic knowledge for professional necessity. Any parties viewing such information are within this same instructional scope and also agree that no information about this patient or case will be discussed or used outside of this environment.

Any cases remaining with the instructor will be stored in a case file that is either physically locked in the digital imaging room or file room storage facility or digitally stored on a password protected computer that will only be accessed by parties covered within the designated instructional scope OR will be disposed of in the same manner as all privacy records on campus. Any case study records returned to the student MUST be immediately returned to the clinical site from which they were released for use.

The Student submitting this case should designate one of the following options, related to the extent of privacy information included:

- ☐ Submitted documents and/or images DO NOT contain any recognizable patient identification.
- ☐ Submitted documents and/or images DO NOT contain any recognizable facility identification.

- ☐ Submitted documents and/or images DO contain information that is recognizable but CANNOT be removed. The Data archiving/PACS system does NOT allow the removal of data or I am NOT provided with any alternate capability to hide patent information.

    - ☐ The recognizable data is related to patient identification.
    - ☐ The recognizable data is related to facility identification.

- ☐ Students are not permitted to remove Images/reports associated with case studies from this facility. Relevant Data pertaining to this case study must be reviewed on site by ChSCC faculty.

Student Signature: _____Date of Signature:_____

Chattanooga State Community College
Diagnostic Medical Sonography Program

Case Study Assessment Guide

	Criteria				
	17	**15**	**13**	**11**	**Points**
Indications/ Presenting Symptoms	Completeness of case history to include: Age, gender, presentation of symptoms/indications, and prior diagnosis or problems.	Case history is complete except one criterion is omitted.	Case history partially complete, two criteria are omitted.	Limited Case history included.	
Sonographic Findings	Excellent description of a specific US exam (with submitted images) to include; US appearance using appropriate medical terminology to describe pathology/findings in students' own words.	Very Good description of US findings and use of terminology, however, one abnormality is omitted. Appropriate images are submitted.	Good description of US findings, however, one abnormality is omitted and/or inappropriate terminology is used. Only a limited number of images are included.	US findings are limited to a copied radiology report. No images/few images are submitted.	
Scanning Problems/ Caveats Involved and How These Were overcome	Scanning caveats/problems are thoroughly discussed along with a description of how these were overcome.	Scanning caveats/problems are discussed along with a limited description of how these were overcome.	Scanning caveats/problems are discussed along with no description of how these were overcome.	Scanning caveats/ problems and a description of how these were overcome were not discussed, only limited entry, such as "no problems"	
Applicability to Present Didactical Studies	Student relates in excellent detail how this case applies to their present didactic studies.	Student relates in very good detail how this case applies to their present didactic studies.	Student relates in good detail how this case applies to their present didactic studies.	Student relates in very limited detail how this case applies to their present didactic studies.	
New Clinical Applicability	Student relates in excellent detail how new technology, instrumentation or other procedures were used to obtain diagnosis for this case.	Student relates in good detail how new technology, instrumentation or other procedures were used to obtain diagnosis for this case.	Student relates in limited detail how new technology, instrumentation or other procedures were used to obtain diagnosis for this case.	Student relates in very limited or no detail how new technology, instrumentation or other procedures were used to obtain diagnosis for this case.	
Additional Information	Excellent additional information is gathered concerning this specific case or pathology including (if available): lab results, imaging reports and /or images from other modalities, surgical notes, pathology reports, and research information concerning the abnormality/pathology.	Good additional information is gathered concerning this specific case or pathology to including (if available): lab results, imaging reports and /or images from other modalities, surgical notes, pathology reports, and research information concerning the abnormality/pathology.	Additional information is gathered concerning this specific case or pathology including (if available): lab results, imaging reports and /or images from other modalities, surgical notes, pathology reports, and research information concerning the abnormality /pathology.	Only limited additional information is gathered concerning this specific case or pathology.	
				Total →	

US 213

Part 1 Vascular Pathology of the Abdomen

Reading Assignment(s):	S. Hagen-Ansert	Chapter 4, pg. 71-107
	Hickey & Goldberg	Chapter 5 (abd. vascular only)
Homework Assignment(s):	Instructional Objectives	
	Hagen-Ansert, Chapter 4, Review Questions 18-41	

Instructional Objectives: Due on exam date

1. Draw a table contrasting the arterial and venous systems.
2. List the major branches of the aorta and explain their function.
3. Describe the major tributaries of the inferior vena cava and tell the organ(s) drained by each one.
4. Identify the key components of the portal venous system and describe the function(s) of that system.
5. List the main types of aortic aneurysms, describe their characteristics and draw an example of each.
6. Identify the important sonographic characteristics associated with an aortic aneurysm.
7. List three ways that Doppler/color Doppler can help diagnose a vascular problem.
8. List the common clinical symptoms related with an abdominal aortic aneurysm.
9. Draw examples of a high resistance and low resistance arterial waveform and explain their differences.
10. Describe the sonographic appearance of tumor or thrombus in arteries and veins.
11. Identify the sonographic findings that may be present with Portal Vein Hypertension.
12. Define the following key words:

Aneurysm	Mycotic aneurysm
Arteriosclerosis	Petechiae
Ecchymosis	Resistive index
Ectasia	Sepsis
Embolism	Spectral broadening
Hyperemia	Marfan's syndrome
Hypoxia	Thrombosis
Infarction	TIPS
Ischemia	Tortuous
	Varices

Topic Outline:

Part 1 Vascular Pathology of the Abdomen

I. Introduction
II. Abdominal vascular review
    a. Vessel walls
        1. Wall layers
        2. Sonographic appearance
    b. Great vessels
        1. Aorta
            - Branches
        2. IVC
            - Tributaries
        3. Sonographic appearance
        4. Relational anatomy
    c. Hepatic vessels
        1. Hepatic veins
        2. Hepatic arteries
        3. Portal triad
    d. Renal Vasculature
        1. Arteries
        2. Veins
    e. Portal venous system
        1. Splenic vein
        2. SMV
III. Blood flow disturbances
    a. Influences of blood flow:
        1. Heart
        2. Vessels
        3. Blood
    b. Hyperemia
    c. Thrombus formation
        1. Arterial thrombus
        2. Venous thrombus
        3. Cardiac thrombosis
    d. Key Words with definitions
IV. Venous Pathology
    a. Thrombosis
    b. IVC abnormalities
        1. Thrombosis
        2. Double IVC
        3. Inferior Vena Cava dilatation
        4. Tumors of the IVC
            - Tumor invasion
V. Portal Vein Hypertension
    a. Prehepatic
        1. Portal vein thrombosis
    b. Intrahepatic
        1. Hepatocellular degeneration and necrosis due to viral hepatitis or alcoholism (cirrhosis)
    c. Posthepatic
        1. Hepatic vein obstruction due to tumor or clot
        2. Budd-Chiari syndrome
    d. Ultrasound Criteria for Portal Vein Hypertension

VI. Aneurysms
- a. Normal wall layers
- b. Major categories
  - 1. True
  - 2. False
- c. Abdominal Aortic Aneurysm
  - 1. Types of Aortic Aneurysms
    - Fusiform
    - Saccular
    - Dissection
- d. How to Measure an Aneurysm
- e. Causes of Aneurysms
- f. Aneurysm Symptoms
- g. Effects of Abdominal Aortic Aneurysms
- h. Surgical Intervention

VII. Hemorrhage
- a. Types of Hemorrhage
- b. Clinical laboratory tests

VIII. Arteriosclerosis
- a. Progression of Atheromatous Disease
- b. Atherosclerosis
  - Different forms
  - Disease features
- c. Complications of Atheromatous Disease
- d. Effects of Atheromatous Disease

IX. Doppler Review
- a. Medical applications
- b. Doppler Effect
- c. Abdominal Doppler
  - Resistive indices
- d. Laminar or Parabolic Flow
- e. Doppler Angle
- f. Spectral Analysis
  - Systole and Diastole
- g. Focal Arterial Stenosis
- h. Flow Patterns
  - High Resistance Doppler Waveform
  - Low Resistance Doppler Waveform
- i. Doppler Waveforms
  - Arterial
  - Venous
- j. Flow Direction

US 213

Part 2 Hepatic Pathology

Reading Assignment(s):	S. Hagen-Ansert	Chapter 5, pg. 110-161
	Hickey & Goldberg	Chapter 7, pg. 128-150
Homework Assignment(s):	Instructional Objectives	
	Hagen-Ansert, Chapter 5, Review questions 20-43	

Instructional Objectives: Due on exam date

1. Describe the sonographic appearance of the different grades of fatty infiltration and focal sparing.

2. List the main types of hepatitis and tell how they are spread.

3. Identify the clinical symptoms related to both acute and chronic hepatitis.

4. Discuss how cirrhosis affects the liver and list the clinical symptoms commonly attributed to the disease.

5. Identify and discuss the clinical lab test(s) which are important when a patient has either a proximal and distal biliary obstruction.

6. List the differential diagnoses for focal diseases of the liver.

7. Explain the relationship of polycystic liver disease to polycystic kidney disease and describe the sonographic characteristics usually related with polycystic liver disease.

8. Describe the typical sonographic characteristics and locations of a hemangioma.

9. Discuss the US findings and clinical presentations related to hepatocellular carcinoma.

10. What is the most common form of neoplastic involvement in the liver?

11. Identify the primary sites that metastatic disease affecting the liver comes from.

12. Describe the ultrasound characteristics of Hodgkin's lymphoma, Non-Hodgkin's lymphoma, and Burkitt's disease.

13. List the liver function tests and tell how they are relevant to liver disease.

14. Discuss how ultrasound can be used in the assessment of a patient with liver trauma.

15. Explain ultrasound's role in the evaluation of the liver transplant patient.

16. Portal vein hypertension may develop over two pathways. Describe them.

17. List the sonographic characteristics associated with portal vein hypertension. Is ultrasound the definitive modality for its diagnosis?

Topic Outline:

Part 2 Hepatic Pathology

I. Introduction
II. Liver anatomy review
III. Sonography of the liver
    a. echogenicity ladder
IV. Liver functions review
    a. Detoxification of waste products
    b. Storage of physiologic compounds
    c. Bile production
    d. Reticuloendothelial functions
    e. Metabolism of food products
v. Clinical laboratory studies
VI. Diffuse hepatocellular disease
    a. Fatty infiltration
        1. Characteristics & causes
        2. Sonographic appearance
    b. Hepatitis
        1. Type A
            - Infectious, spread by oral/fecal route
        2. Type B
            - Serum hepatitis
            - Contracted by an infected person's body secretions such as blood, saliva, and semen
        3. Type C
            - Caused by inoculations and transfusions
        4. Acute and Chronic
    c. Cirrhosis
        1. Clinical symptoms
        2. Sonographic appearance
        3. Associated findings
        4. Laboratory findings
        5. Laënnec's disease
    d. Glycogen Storage Disease
        1. Categories
        2. Sonographic appearance
        3. Hemochromatosis
VII. Obstructive Abnormalities of the Liver Parenchyma
    a. Biliary obstruction proximal to the cystic duct
    b. Distal biliary obstruction
VIII. Focal Hepatic Abnormalities
    a. Cystic Lesions
        1. Simple
        2. Congenital
        3. Polycystic disease
        4. Hemangioma
            - Cavernous
            - Capillary
        5. Lymphoma
            - Hodgkin's disease
            - Non Hodgkin's

- Burkitt's

6. Leukemia

IX. Focal Hepatic Abnormalities-Solid Lesions
   a. Liver Cell Adenoma
   b. Focal Nodular Hyperplasia

X. Hepatocellular Carcinoma (HCC)
   a. Hepatoma or Hepatocarcinoma
      1. Presenting symptoms
      2. Laboratory tests
      3. Sonographic appearance

XI. Primary Hepatic Malignancy
   a. Cholangiocarcinoma
      1. Location
      2. Sonographic appearance

XII. Liver Metastases
   a. Clinical findings
   b. Sonographic Appearance
      1. Cystic
      2. Diffuse
      3. Target
      4. Discrete
   c. Primary sites
      1. Colon
      2. Breast
      3. Lung

XIII. Neoplasm
   a. Definition – benign versus malignant

XIV. Types of Cancer
   a. Carcinoma
   b. Sarcoma
   c. Differentiated tumors
   d. Undifferentiated tumors
   e. Tumor grades

XV. Effects of Malignant Tumors

XVI. Cancer Dispersion Patterns
   a. Infiltration of tissues
   b. Lymphatic spread
   c. Blood
   d. Natural passages
   e. Serous cavities
   f. Implantation
   g. Remission
   h. Carcinoma in situ

XVII. Carcinogens

XVIII. Cancer Treatments

IXX. Fungal Infections

XX. Animal Parasites
   - Echinococcal Cyst (Hydatid)

XXI. Hepatic Vascular Flow Abnormalities
   a. Portal Venous Hypertension
      1. Indications
      2. Portal Venous Hypertension Secondary to chronic Disease
      3. Sonographic findings
      4. Portal Venous Hypertension due to Thrombus
         - Treatment –Transjugular Intrahepatic Portosystemic Shunt (TIPS)

b. Budd Chiari Syndrome
    1. Cause
    2. Prognosis
    3. Clinical indications
    4. Etiology
    5. Ultrasound findings

XXII. Miscellaneous Liver Conditions
    a. Hepatic Trauma
    b. Liver Transplant

US 213

Part 3 Biliary Tract Pathology

Reading Assignment(s):	Hagen-Ansert, Chapter 6, pages 164-191 Hickey & Goldberg, Ch. 2, 11-22 & Ch. 4, pg. 36-55
Homework Assignment(s):	Instructional Objectives Hagen-Ansert, Chapter 6, Review Questions 9-20

Instructional Objectives: Due on exam date

1. Describe a cholecystectomy and discuss what happens to the biliary tract and the storage and flow of bile after a patient undergoes one.

2. Draw a table identifying the three major types of jaundice (be specific) and tell which laboratory test(s) would be abnormal with each one and why.

3. Can a patient have a dilated biliary duct and not be jaundiced? Defend your answer.

4. Discuss the significance of a thickened gallbladder wall found during a gallbladder ultrasound.

5. List the clinical symptoms of gallbladder disease.

6. Describe a choledochal cyst and list other pathologies that are related to them.

7. Describe the sonographic differences of adenomyomatosis and gallbladder polyps.

8. Describe the typical sonographic characteristics of cholelithiasis and explain what factors make a stone produce a shadow.

9. Discuss the US findings and clinical presentations related to primary carcinoma of the gallbladder.

10. Describe a Courvoisier gallbladder and list the sonographic findings usually associated with this pathology.

11. List at least three caveats in imaging the gallbladder.

12. Describe the location and ultrasound characteristics of a Klatskin's tumor.

13. What is the "WES" sign? Describe the unique sonographic characteristics of this finding.

14. Draw a table comparing the clinical symptoms and US findings of acute and chronic cholecystitis.

15. Explain ultrasound's role in the evaluation of emphysematous cholecystitis and discuss the complications related to it.

Topic Outline:

I. Introduction
II. Biliary Review
    a. Anatomy – Gallbladder
        1. Size
        2. Location
    b. Anatomy – Ducts
        1. Common hepatic
        2. Right and left hepatic
        3. Cystic duct
        4. Common bile duct
            - Size
            - Location
    c. Sonographic appearance
    d. Physiology
        1. Collects, stores, and concentrates bile before it is transported to the intestines
    e. Laboratory tests
        1. Total Bilirubin
        2. Alkaline Phosphatase
III. Biliary Tract Pathology
    a. Clinical Signs of Gallbladder and Bile Duct Disease
        1. Three major categories of jaundice
            - Medical
                - Intrahepatic and nonobstructive
            - Surgical
                - Post hepatic obstruction
            - Prehepatic/hemolytic
                - Blood disorders which cause abnormal breakdown of RBC's
    b. Ultrasound and Obstructive Jaundice
        1. Sonographic findings
            - Dilated intrahepatic ducts
                - "Stellate" or spoke-like appearance
                - "Double barrel" appearance
                - "Double Channel" Sign
            - Choledocholithiasis
                - Typical appearance
                - Obstruction of CBD
        2. Porta Hepatis Mass
            - Cholangiocarcinoma

- Klatskin's tumor

3. Mass at the distal end of the CBD
    - Clinical findings
    - Sonographic appearance
4. Courvoisier Gallbladder
    - Clinical symptoms
    - Sonographic appearance
5. Other causes of Dilated Ducts
    - Cholangitis
    - Caroli's Disease (congenital duct atresia)
    - Chronic intermittent obstruction of CBD by mobile stones
    - Choledochal cyst
    - Strictures
    - Lymphadenopathy
    - Pneumobilia
    - Hemobilia

IV. Sonography of the Gallbladder – normal and abnormal

a. Gallbladder Variants
b. Advantages
c. Reasons for nonvisualization of gallbladder
d. Gallbladder wall
    1. Measurement - size
    2. A thickened wall is nonspecific for GB disease
e. Courvoisier gallbladder
f. Contracted, non-visualization of GB
g. Murphy's sign
h. Caveats in Gallbladder Imaging

V. Pathology of the Gallbladder

a. Cholelithiasis
    1. Imaging Cholelithiasis
    2. Why Do Gallstones Cause Pain?
    3. Incidence of Gallstones
    4. Formation of Gallstones
    5. WES triad
b. Cholecystitis
    1. Acute and chronic cholecystitis
        - Symptoms
        - Sonographic appearance
c. Empyema
d. Emphysematous Cholecystitis
e. Gangrene of the Gallbladder
f. Gallbladder Carcinoma
g. Biloma
h. Porcelain Gallbladder
i. Acalculous Cholecystitis
j. Sludge
    - Tumefactive sludge
k. Gallbladder Polyps
    - Cholesterolosis
l. Hyperplastic Cholecystosis
m. Benign papillomas
n. Adenomyomatosis
o. Endoscopic Retrograde Cholangiopancreatography

US 213

Part 4 Pancreas Pathology

Reading Assignment(s):	Hagen-Ansert	Ch. 7, pg. 194-223
	Hickey & Goldberg	Ch. 9, pg. 169-184
Homework Assignment(s):	Instructional Objectives	

Instructional Objectives: Due on exam date

1. List the principle laboratory tests used to help diagnose pancreatic dysfunction or pathology and explain what an abnormal result could mean.

2. Describe the sonographic appearance of cystic fibrosis and explain how this disease affects the pancreas.

3. List the congenital anomalies of the pancreas and give a brief description of each.

4. Identify the clinical signs and symptoms related to both acute and chronic pancreatitis.

5. Explain how an acute pancreatic attack develops and describe the related complications.

6. Draw a table contrasting the ultrasound findings related to acute and chronic forms of pancreatitis.

7. Discuss the clinical signs, symptoms, and sonographic appearance of a pancreatic abscess.

8. Describe how a true pancreatic cyst and a pseudocyst are different.

9. Explain how a pancreatic pseudocyst is formed (including the most common locations) and describe the usual sonographic characteristics.

10. Discuss the clinical signs, symptoms, and sonographic appearance of a pancreatic cystadenoma and cystadenocarcinoma.

11. Name the most common primary neoplasm of the pancreas and explain why it is often fatal.

12. List the clinical signs and symptoms of adenocarcinoma of the pancreas.

13. Discuss the sonographic patterns that are characteristic of adenocarcinoma of the pancreas.

14. Describe the types of Islet Cell tumors and tell where they are usually located.

15. What is Courvoisier's Law?

16. Describe the metastatic disease most commonly seen within the pancreas.

17. Define Key Words:

Acini cells	Annular pancreas	Glucagon
Hyperlipademia	Islets of Langerhans	Phlegmon

Topic Outline:

I. Introduction
II. Review of the digestive system
III. Review of normal anatomy and physiology of the pancreas
    a. Related anatomy of the pancreas
    b. Location
    c. Size
    d. Contour and shape
IV. Sonographic Assessment of the Pancreas
    a. Pancreas Sonographic Anatomy
    b. Vascular Landmarks
V. Pancreatic Ductal System Review
VI. Pancreatic Physiology Review
    a. Aging Characteristics
    b. Fatty Replacement of the Pancreas
    c. Pancreatic functions
        1. Exocrine
        2. Endocrine
VII. Laboratory Test Review
    a. Amylase
    b. Lipase
    c. Glucose
VIII. Pancreatic Pathology
    a. Pancreatic Neoplasms
        1. Adenocarcinoma
            - Clinical symptoms
            - Sonographic appearance
            - Associated findings
            - Complications
        2. Cystadenoma
            - Clinical symptoms
            - Sonographic appearance
        3. Cystadenocarcinoma
            - Clinical symptoms
            - Sonographic appearance
        4. Other cysts
        5. Islet Cell Tumors
            - Clinical symptoms
            - Sonographic appearance
    b. Pancreatic Infections
        1. Acute Pancreatitis
            - Clinical symptoms
            - Sonographic appearance
            - Associated findings
            - Complications
                - Phlegmon
                - Hemorrhagic Pancreatitis
                - Pancreatic Pseudocysts
                - Pancreatic Abscesses

2. Chronic Pancreatitis
    - Clinical symptoms
    - Sonographic appearance
    - Associated findings
    - Complications

c. Pancreatic Anomalies
    1. Ectopic pancreatic tissue
    2. Left-sided pancreas
    3. Annular pancreas
    4. Congenital pancreatic cysts
    5. Fibrocystic pancreatic disease

d. Pancreas Transplants

US 213

Part 5 Renal Pathology

Reading Assignment(s):	Hagen-Ansert	Ch. 9, pg. 245 - 307
	Hickey & Goldberg	Ch. 6, pg. 75 -115
Homework Assignment(s):	Instructional Objectives	

Instructional Objectives: Due on exam date

1. List the laboratory tests used to evaluate the urinary system and tell how they are relevant to renal disease.

2. Describe the following renal variants and their sonographic appearance:
    Horseshoe kidney
    Hypertrophied column of Bertin
    Dromedary hump
    Junctional parenchymal defect
    Extrarenal pelvis
    Sinus lipomatosis

3. Explain how each variant in #2 could be mistaken as pathology.

4. List at least 10 sonographic applications for imaging the urinary system.

5. List the sonographic criteria for a simple renal cyst.

6. Describe hydronephrosis of the kidney, its stages, and sonographic appearance.

7. Describe conditions that can mimic hydronephrosis.

8. List three cystic renal autosomal-dominant genetic disorders and explain the ultrasound findings seen with each.

9. Contrast infantile polycystic kidney disease (IPKD) with multicystic dysplastic kidney disease (MCDK).

10. Discuss medullary sponge kidney and medullary nephrocalcinosis and describe how they appear sonographically.

11. Identify the most common malignant renal tumor and describe the ultrasound appearance and stages.

12. List the classic triad of clinical findings for renal cell carcinoma.

13. Identify the most common renal disease to produce renal failure and describe it.

14. Create a table showing prerenal, renal, and postrenal causes of renal failure and the sonographic appearance of each.

15. Discuss transitional cell carcinoma of the kidney, ureters, and urinary bladder. Include number, location, incidence, differential diagnosis, and sonographic findings in your discussion.

16. Explain the clinical and sonographic findings related to a Wilm's tumor.

17. Describe how the kidney is affected by acute glomerulonephritis.

18. Define the following renal infections: pyonephrosis, emphysematous pyelonephritis, acute interstitial nephritis, and Lupus nephritis.

19. Describe the sonographic appearance of renal atrophy and renal infarction.

20. List three benign solid renal tumors and describe the ultrasound findings related to them.

21. Describe the extraperitoneal fluid collections associated with renal transplants: lymphocele, urinoma, hematoma (or seroma), and abscess.

22. Discuss the role of sonography in the evaluation of a renal transplant patient (make sure to include Doppler and color Doppler).

23. Describe acute tubular necrosis and tell how it is related to renal transplant failure.

24. Identify and discuss the treatment choices for renal failure.

25. List the most common sites for renal stone obstruction.

26. Identify the causes for renal transplant rejection and describe.

27. Define and describe the sonographic appearance of an ureterocele, megaureter, and bladder diverticulum and explain the complications associated with them.

28. List the causes of cystitis and describe the ultrasound findings seen with this condition.

29. Discuss congenital urachal anaomalies.

Topic Outline:

I. Introduction
II. Urinary System Review
    a. Anatomy
        1. Medulla
        2. Cortex
        3. Renal sinus
        4. Hilum
        5. Renal pelvis
        6. Ureter
        7. Urinary Bladder
    b. Size and location
    c. Physiology
    d. Laboratory tests
        1. Blood Urea Nitrogen
        2. Creatinine
        3. Urinalysis
    e. Renal Vascularity
        1. Doppler Ratios
        2. Doppler Waveforms
III. Sonographic Applications
    a. Evaluation
    b. Sonographic appearance of adult kidneys
IV. Renal Variants of Normal and Congenital Anomalies
    a. Dromedary hump
    b. Hypertrophied column of Bertin
    c. Duplex Collecting System
    d. Horseshoe kidney
    e. Ectopic kidneys
    f. Crossed renal ectopia
    g. Cross fused renal ectopia
    h. Extrarenal pelvis
    i. Renal Agenesis
    j. Hypoplastic Kidneys
    k. Renal sinus lipomatosis
    l. Persistent fetal lobulations
    m. Parenchymal Junctional Defect
    n. Ureteropelvic junction obstruction (UPJ)
V. Renal Cystic Disease
    a. Simple cyst
    b. Parapelvic Cyst
    c. Cysts associated with multiple renal neoplasms
        1. Von Hippel-Lindau disease
        2. Tuberous Sclerosis
    d. Acquired cystic kidney Disease
    e. Acquired cystic kidney Disease
    f. Congenital Cystic Disease
        1. Polycystic Renal Disease, (Infantile type) IPKD
        2. Juvenile Type Polycystic Renal Disease
        3. Polycystic Renal Disease (Adult type) APKD
    g. Renal Dysplasia
        1. Multicystic Dysplastic Kidney Disease (MCDK)
    h. Medullary Cystic Disease
        1. Medullary Sponge Kidney
        2. Medullary Nephrocalcinosis

i. Multilocular Cystic Nephroma

VI. Malignant Renal Neoplasms
- a. Renal Cell Carcinoma
  - 1. Also called "hypernephroma"
  - 2. Clinical findings
  - 3. Sonographic appearance
  - 4. Renal Cell Carcinoma Staging
- b. Transitional Cell Carcinoma
  - 1. Clinical findings
  - 2. Sonographic appearance
- c. Renal Lymphoma
- d. Metastases to Kidneys

VII. Benign Renal Neoplasms
- a. Angiomyolipoma
- b. Adenoma
- c. Fibroma
- d. Lipoma
- e. Myoma
- f. Hemangioma

VIII. Normal Sonographic Appearance of pediatric kidneys
- a. Echogenicity
- b. Shape
- c. Size
- d. Echotexture

IX. Pediatric Neoplasms
- a. Nephroblastoma
  - Wilm's tumor or sarcoma of the kidneys
- b. Neuroblastoma
  - Highly malignant tumor of the adrenal gland
    - Do not confuse with nephroblastoma
- c. Mesoblastic Nephroma
  - Renal Hamartoma

X. Hydronephrosis
- a. Clinical findings
- b. Sonographic appearance
- c. Spectrum of Hydronephrosis

XI. Renal Calcifications
- a. Nephrolithiasis

XII. Renal Infarction

XIII. Renal Infection
- a. Nephritis – general term used for any inflammation of the kidney

  May involve:
  - Glomeruli (glomerulonephritis)
  - Renal spaces (interstitial nephritis)
  - Main tissue and pelvis (pyelonephritis)
- b. Pyonephrosis
- c. Pyelonephritis
- d. Emphysematous Pyelonephritis
- e. Renal Abscess
  - Abscesses are usually corticomedullary or cortical
- f. Acute Tubular Necrosis (ATN)
- g. Acute Glomerulonephritis
- h. Lupus Nephritis

XIV. The Malfunctioning Kidney

a. Acute renal failure

b. Chronic renal failure (renal insufficiency)

c. Etiologies of renal malfunction have been categorized as:

1. Pre-renal
2. Renal
3. Post-renal

d. Sonographic appearance

e. Treatment for Renal Failure

1. Hemodialysis
2. Peritoneal dialysis
3. Kidney transplantation

- Renal Transplant Baseline Sonogram
- Doppler Flow Studies
- Complications after transplant
- Extrarenal Transplant Fluid Collections
- Transplant failure causes

XV. Urinary Bladder

a. Urinary Bladder Post Void Volume

b. Sonographic evaluation

c. Ureterocele

d. Megaureter

e. Urinary Bladder Pathology

1. Diverticulum
2. Bladder Inflammation (Cystitis)
3. Transitional Cell Carcinoma

f. Urachus

1. Congenital Urachal Anomalies

US 213

Part 6 Spleen Pathology

Reading Assignment(s):	Hagen-Ansert	Ch.10, pg. 308-325
	Hickey & Goldberg	Ch. 13, pg. 239-252
Homework Assignment(s):	Instructional Objectives	

Instructional Objectives: Due on exam date

1. Identify the different types of cysts seen within the spleen and describe their ultrasound appearance.

2. Describe the following splenic variants and their sonographic appearance:
   - Accessory spleen
   - Wandering spleen
   - Asplenia
   - Polysplenia
   - Upside-down spleen

3. Discuss the arterial, venous, and lymphatic vessels related to the spleen.

4. List at least six causes of splenomegaly.

5. Define the following laboratory terms:
   - Bacteriemia
   - Hematocrit (HCT)
   - Hemoglobin (HGB)
   - Erythrocyte (RBC)
   - Leukocytosis
   - Leukopenia
   - Lymphocytes (T & B cells)
   - Thrombocytopenia
   - White Blood Cell Count (WBC)

6. Identify three benign primary tumors of the spleen and describe their appearance on ultrasound.

7. Discuss malignant primary neoplasms of the spleen, listing the types and their sonographic properties including the four different patterns often seen with lymphoma.

8. The spleen is the tenth most common site of metastasis. List the organs/structures that usually metastasize to the spleen.

9. Discuss sonography's role in the evaluation of trauma patients with possible injury to the spleen. List the clinical signs, symptoms, and sonographic appearance of spleen lacerations and hemorrhage.

10. Explain the etiologies of a splenic infarct and describe how to recognize an infarction while imaging the spleen.

11. Discuss the ultrasound findings usually seen with Acquired Immune Deficiency Syndrome (AIDS).

12. Describe the different sonographic patterns observed with a splenic infection.

13. Identify and list the causes of congestive splenomegaly.

14. Describe the following diffuse diseases of the spleen:
    Sickle Cell Anemia
    Hereditary or Congenital Spherocytosis
    Hemolytic Anemia
    Polycythemia Vera
    Thalassemia
    Myeloproliferative Disorders
    Granulocytopoietic Abnormalities
    Reticuloendotheliosis
    Letterer-Siwe Disease
    Hand-Schüller-Christain Disease

15. Identify three storage diseases of the spleen and describe the sonographic properties of each disease.

16. List three differential diagnoses for an abscess of the spleen and describe the sonographic appearance of an abscess.

Topic Outline:

I. Introduction
II. Spleen Review
    a. Prenatal Development
    b. Physiology
    c. Functions of the Spleen
        1. Reticuloendothelial system functions
        2. Functions characteristic of the spleen
    d. Normal Splenic Anatomy
        1. Location
        2. Relational Anatomy
        3. Size and shape
        4. Blood supply
III. Sonographic Applications
    a. Evaluation
    b. Sonographic appearance
    c. Echogenicity ladder
IV. Splenic Variations
    a. Accessory spleen
    b. Polysplenia
    c. Wandering spleen
    d. Asplenia or splenic agenesis
    e. Upside-down spleen
V. Pathology of the Spleen
    a. Splenomegaly
    b. Congestive Disease
    c. Storage Disease
        1. Amyloidosis
        2. Gaucher's Disease
        3. Niemann-Pick Disease

d. Diffuse Disease
    1. Sickle Cell Anemia
    2. Hereditary or Congenital Spherocytosis
    3. Hemolytic Anemia
    4. Polycythemia Vera
    5. Thalassemia
    6. Myeloproliferative Disorders
    7. Granulocytopoietic Abnormalities
    8. Reticuloendotheliosis
    9. Letterer-Siwe Disease
    10. Hand-Schüller-Christain Disease

e. Lymphopoietic Abnormalities
    1. Leukemia

f. Focal Disease
    1. Splenic Abscess
    2. Splenic Infection
    3. Acquired Immune Deficiency Syndrome (AIDS)
    4. Splenic Infarction and Trauma
    5. Splenic Trauma
    6. Splenic Cysts
    7. Benign Primary Neoplasm
    8. Malignant Primary Neoplasm

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Part 7 Pathology of the Reticuloendothelial System

Reading Assignment(s):	Hagen-Ansert	pg. 153, 298, 325, 344-345 & 358
	Hickey & Goldberg	pg. 204, 241-244 & 249-250
Homework Assignment(s):	Instructional Objectives	

Instructional Objectives: Due on exam date

1. Identify the common causes of lymphadenopathy.

2. Determine the best imaging modality for the evaluation of lymphadenopathy and describe why.

3. Explain sonography's role in the evaluation of lymphadenopathy including the classification of nodes by location and size.

4. Describe the sonographic appearance of abdominal lymphadenopathy and list the findings related to malignant nodes.

5. Identify the locations in the abdomen in which lymphadenopathy is often found.

6. List the effects of lymphadenopathy.

7. Describe the sonographic “sandwich sign” and the “silhouette sign”.

8. List differential diagnoses for retroperitoneal lymphadenopathy and mesenteric or omental nodes.

9. Discuss Hodgkin’s and NonHodgkin’s diseases including cell type and characteristic sonographic findings.

10. Describe Burkitt’s lymphoma, including causes, cell type, age group, and sonographic appearance.

11. List possible scanning caveats when evaluating abdominal lymphadenopathy.

12. Define Key Words:

Leukocytosis	Leukopenia
Lymphocele	Lymphoproliferative disorder
Lymphoma	Phagocytosis
Reed-Sternberg cells	Retroperitoneal Fibrosis

Topic Outline:

I. Introduction
II. Reticuloendothelial System Review
    a. Laboratory data
    b. Immune cells
        1. T-lymphocytes
        2. B-lymphocytes
        3. RE system components
            - Lymph
            - Capillaries
            - Lymph vessels
            - Lymph ducts
            - Lymph nodes
III. Lymphatic System Review
    a. Sonographic Evaluation
        1. Sonographic appearance
IV. Pathology of the Reticuloendothelial System
    a. Lymphadenopathy
        1. Computerized Tomography
            - “Gold standard”
        2. Sonographic applications/appearance
            - “Sandwich sign”
            - “Silhouette” sign
        3. Criteria for Assessing Nodal Disease
        4. Common sites
        5. Lymphadenopathy Effects
        6. Retroperitoneal Lymphadenopathy
        7. Mesenteric or Omental Nodes
        8. Sonographic Differential for Lymphadenopathy

b. Lymphoma
    1. Divided into two main categories
        - Hodgkin's Disease or Hodgkin's Lymphoma (8%)
        - Non-Hodgkin's Lymphoma (approx. 92%)
    2. Lymphoma Risk Factors
    3. Lymphoma Symptoms
    4. Hodgkin's Disease (HD)
    5. Burkitt's Lymphoma
    6. Lymphoproliferative disorder
    7. Staging of Lymphomas
    8. Lymphocele
    9. Metastatic spread
c. Scanning Caveats
d. Retroperitoneal Fibrosis

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Part 8 Other Retroperitoneal Abnormalities

Reading Assignment(s): Hagen-Ansert, Ch. 11 pg. pg. 327-345
Hickey & Goldberg, pg. pg. 1-10 & 185-206

Homework Assignment(s): Instructional Objectives

Instructional Objectives: Due on exam date

1. Identify the boundaries of the retroperitoneal cavity and list the structures located within it.

2. Describe the following:
    Anterior pararenal space
    Perirenal space
    Posterior pararenal space

3. Identify the hormones produced by the adrenal cortex and medulla and describe the function of each.

4. Compare the sonographic appearance and size of the adult adrenal with the adrenal of a neonate.

5. List and describe the syndromes of the adrenal cortex which may be encountered by the sonographer while evaluating a patient for an adrenal mass.

6. Contrast the ultrasound appearance of an adrenal neuroblastoma with a nephrobastoma.

7. Describe retroperitoneal fibrosis and its sonographic appearance.

8. Identify and define four types of retroperitoneal fluid collections (include the cause and sonographic appearance

of each).

9. Identify and describe the benign adrenal tumor which causes excessive secretions of epinephrine and norepinephrine.

10. Discover the three most common primary malignant retroperitoneal tumors.

11. Name and describe the sonographic appearance of the most common malignant adrenal tumor.

12. Discuss adrenal carcinoma.

Topic Outline:

I. Retroperitoneal Spaces Anatomical Review
II. Retroperitoneal Fluid Collections
    a. Urinomas
    b. Hematomas
    c. Abscesses
    d. Lymphoceles
    e. Effects of Fluid Collections
III. Retroperitoneal Fibrosis
IV. Lymphadenopathy
    a. Lymphatics Review
    b. Pathology of the RES Review
V. Retroperitoneal Tumors
    a. Benign
        1. Lipoma
        2. Leiomyoma
    b. Malignant
        1. Liposarcoma
        2. Leiomyosarcoma
VI. Adrenal Pathology
    a. Adrenal Gland Review
        1. Sonographic Appearance
        2. Location
    b. Adrenal Cysts
    c. Adrenal Hematoma
    d. Adrenal Tumors
        1. Pheochromocytoma
        2. Neuroblastoma
    e. Cushing's Syndrome
    f. Addison's Disease
    g. Adrenogenital Syndrome
    h. Adrenal Metastasis
    i. Adrenal Carcinoma