

Polysomnographic Technology Assessment Report 2008-09

I. Introduction

This program is designed to meet the needs of new technicians working in clinics across the country. New regulations become effective in 2012 requiring technicians sitting for the national registry exam to have completed a program accredited by the Commission on Accreditation of Allied Health Education Programs (CAAHEP) instead of on-the-job training. This distance education program is designed to meet the CAAHEP Committee on Accreditation for Polysomnographic Technology (CoA PSG) standards and the needs of place-bound technicians. The entire program is delivered online with local clinical facilities, where the students are located, providing the clinical practicum.

This is a fairly new program and enrollment is growing at a faster pace than expected. The enrollment as of April 2009 is 35 current students with 3 more applications in progress. Six students have completed the Certificate program since August 2008.

All six graduates are employed in sleep labs and their supervisors have rated them all as excellent technologists. Starting salaries range from \$38,000 to \$41,000 depending on the location.

II. Program Purpose, Objectives and Student Learning Outcomes

We have had one advisory board meeting. The meeting covered the 2008-09 assessment and program revisions. The meeting was held April 9, 2009. The discussion covered assessment of the program objectives, review of the last year, programs changes and their justification, and recommendations for improvements.

Mission/Purpose

The Polysomnographic Technology Program provides instruction and clinical practice, in a distance learning format. The program prepares students to achieve professional proficiencies and acquire professional credentials in sleep medicine technology.

Educational Objectives

The polysomnography program prepares students for immediate employment anywhere in the United States in a high demand health care profession.

Expected Program Learning Outcomes

Graduates of the Polysomnographic Associate Degree and Certificate program will have demonstrated:

1. ability to perform analysis of pre-testing information.
2. ability to accurately prepare the equipment and patient for data collection.
3. ability to accurately collect data and summarize clinical observations.
4. ability to accurately analyze, interpret, and report data.
5. a thorough understanding of normal and disordered sleep.
6. the ability to apply standard precautions throughout the patient's evaluation in order to prevent the spread of infection to patients and staff.

7. knowledge of how to provide patient support and educational information.
8. knowledge of site management.

Other learning opportunities

Some of the students may attend the annual American Association of Sleep Technologists conference held the first week of June. Many regional PSGT associations also hold local conferences.

III. Cycle for Assessment of Student Learning Outcomes

In accordance with CAAHEP guidelines, all outcomes will be evaluated annually. The mapping of these outcomes to the curriculum can be found in Appendix A.

IV. Summary of 2008-09 Assessment Activities

Student Learning Outcome #1: demonstrate the ability to perform analysis of pre-testing information.

This outcome was assessed through a case study required at the start of the mock exam held at the conclusion of the practicum. Students were required to be in residence on the OIT campus for this exam. The case came from the clinical facility of our medical director and included actual physicians’ orders. A rubric with a four point scale (no/limited proficiency, some proficiency, proficiency, high proficiency) was used to determine student progress on the performance criteria shown in Table 1 below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Identifies accurate & inaccurate test requests	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Identifies appropriate testing methods used	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Identifies external factors affecting testing	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%

Table 1. Assessment Results for SLO #1 practicum mock exam.

Analysis of data

One case was given but it was fairly comprehensive. All four students eventually recognized the issues but it took some coaxing for one of them.

Improvements for this learning outcome

The assessment is adequate. It was rewritten from the last time it was given with much better results.

Student Learning Outcome #2: demonstrate the ability to accurately prepare the equipment and patient for data collection.

This outcome was assessed through a mock practical exam that students took at the end of their third and final clinical practicum. This mock exam was given on the OIT

campus and required that students be in residence. A rubric with a four point scale (no/limited proficiency, some proficiency, proficiency, high proficiency) was used to determine student progress on the performance criteria shown in Table 2 below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Accurately calibrated computers used for data acquisition.	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Selected proper settings based on physician orders and best practices.	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Determined correct montage and accurately applied equipment.	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Correctly interfaced ancillary equipment to primary recording computer.	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Correctly applied ancillary equipment to patient	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Correctly conducted physiological calibrations and corrected problems.	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Demonstrated proper patient communications	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%

Table 2. Assessment Results for SLO #2 in practicum mock exam

Analysis of Data

This was a pass/fail exam. All four students passed with no problems.

Improvements for this learning outcome

The assessment tool was rewritten from last year. The check off list is much better organized and allows for easier administration of the test. No improvements are needed for next year.

Student Learning Outcome #3: demonstrate the ability to accurately collect data and summarize clinical observations.

This outcome was assessed through a mock practical exam that students took at the end of their third and final clinical practicum. This mock exam was given on the OIT campus and required that students be in residence. A rubric with a four point scale (no/limited proficiency, some proficiency, proficiency, high proficiency) was used to determine student progress on the performance criteria shown in Table 3 below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Recognize and visually discriminate appropriate waveforms from instrument artifact	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Make appropriate alternations to recording parameters	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Correctly identify how to recognize and respond to clinically significant events and emergency situations	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Follow protocols	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Correctly identify how to titrate PAP/O2	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Correctly identify how to recognize and respond to seizures	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	50%
Correctly identify how to perform CPR	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	75%
Apply CPAP interfaces and interventional equipment	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%

Table 3. Assessment Results for SLO #3 in mock practical exam

Analysis of Data

This was a pass/fail exam. All four students passed the exam for this objective.

Improvements for this learning outcome

There was one problem area, the recognition of seizure activity. Although all of the students had seen tracings in books of seizure activity, none had actually seen it in the lab. Only two could accurately describe what it would look like. This will need to be covered in more detail in PSG 231.

The assessment tool also was rewritten from last year. The check off list is much better organized and allows for easier administration of the test. We also provided more time for students to familiarize themselves with the equipment which lead to their success. Since there are a large number of different manufacturers of PSG equipment, the likelihood of students having trained on the same type of equipment that they are tested on is minimal. Students were less stressed and could think more clearly with this change. No improvements are needed for next year.

Student Learning Outcome #4: demonstrate the ability to accurately analyze, interpret, and report data.

This outcome was assessed through mock practical and written exams that students took at the end of their third and final clinical practicum. This mock exam was given on the OIT campus and required that students be in residence. A rubric with a four point scale (no/limited proficiency, some proficiency, proficiency, high proficiency) was used to determine student progress on the performance criteria shown in Table 4 below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Identify sleep stages	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Identify wake, arousals, body movements and movement time	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Recognize and visually discriminate appropriate waveforms from instrument artifact	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Document SaO ₂ and CO ₂ changes,	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Document sleep apnea & hypopnea	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Identify limb movements (e.g., periodic, restless legs, fragmentary myoclonus)	Mock exam	1-4, % at 3 or 4	80% at 3 or 4	100%
Recognize cardiac arrhythmias	Written exam	1-4, % at 3 or 4	80% at 3 or 4	25%
Calculating all sleep statistics	Written exam	1-4, % at 3 or 4	80% at 3 or 4	50%

Table 4. Assessment Results for SLO #4 in mock and written exams

Analysis of Data

Recognition of cardiac arrhythmias and calculating sleep statistics were the weakest skills.

Improvements for this learning outcome

This was an improvement over last year. Last year there were several identified weak areas in transitional and artifact issues. During the year greater emphasis was placed on recognizing stage transitions which caused students problems last year. These areas were re-assessed this year, and there is no longer a problem.

During PSG 254, the last segment of the practicum, more emphasis needs to be placed on calculating sleep statistics. Additional problems will be developed and assigned.

All of the students performed well in the ECHO 227 Basic ECG Recognition and Testing course however they failed to remember the material. This course will be revised as indicated below:

1. Added to the course will be a review of an anatomy and physiology and a web link to ECG examples. This same information will be included in a review packet to be disseminated at the end of the program.
2. Revise the way the course tests, so that it is not so overwhelming for the students. Testing will be done in a way that builds confidence and skills. The publisher tests that have been previously used are detailed but may not promote the greatest level of learning.
3. Add examples in the discussion and talk about the main rhythms as a group. These examples will be the main ones they will likely be asked to know on their registry exam.

Student Learning Outcome #5: demonstrate a thorough understanding of normal and disordered sleep.

This outcome was assessed through a written exam that students took at the end of their third and final clinical practicum. The test was given at the same time as the mock exam, on the OIT campus. Students were required to be in residence for this experience. The test covered the performance criteria listed in Table 5 below.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Demonstrated knowledge of all characteristics normal sleep	Written exam	1 point per question	80% of answers correct	75%
Demonstrated knowledge of the characteristics of the various sleep disorders	Written exam	1 point per question	80% of answers correct	75%
Demonstrate ability to identify a disorder in a tracing	Written exam	1 point per question	80% of answers correct	100%

Table 5. Assessment Results for SLO #5

Analysis of Data

This was assessed via two different exams. The first was the “post-test” that was the identical test given the first week of the program. The second exam was a “post-course exam” consisting of questions that are distributed by the Board of Registered Polysomnographic Technologists. Three of the four students successfully passed both exams with the low score of 89%. One student failed the post test by two points and barely passed the post-course test by one point. His scores brought the overall averages down. Upon review of the tests with him, it was discovered that he is a poor test taker and did not read a large number of the questions correctly. When verbally

asked the questions, he knew the answers. The specific weakest areas were physiology and pharmacology.

Improvements for this learning outcome

More emphasis will be placed on the weak areas of physiology and pharmacology. Additional assignments will be given focusing on these two areas. Review information and questions in this area will be included in a review packet of information to be disseminated at the end of the program.

Last year, there were weaknesses identified in physiology, scoring and instrumentation. Compared to last year, assessment showed that group scores had improved in staging and scoring with the additional emphasis on these areas this year. Instrumentation was also re-assessed and was not in issue in student learning. Physiology, as noted above, continues to be a problem.

Student Learning Outcome #6: demonstrate the ability to apply standard precautions throughout the patient’s evaluation in order to prevent the spread of infection to patients and staff.

This outcome was assessed through a comprehensive written exam that students took at the end of their third and final clinical practicum. This written exam was given on the OIT campus and students were required to be in residence.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Demonstrated knowledge of standard safety precautions to prevent the spread of infection	Written Exam	1 point per question	80% of answers correct	100%

Table 6. Assessment Results for SLO #6 in

Analysis of Data

This content area was tested by both the “pre-test” and “post-course exam”. Almost all questions were correctly answered by everyone.

Improvements for this learning outcome

We will continue doing what we are doing for this objective since we have shown positive results.

Student Learning Outcome #7: demonstrate the knowledge of how to provide patient support and educational information.

This outcome was assessed through a comprehensive written exam that students took at the end of their third and final clinical practicum. This written exam was given on the OIT campus and students were required to be in residence.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Demonstrated knowledge of providing patient support and educational information	Written Exam	1 point per question	80% of answers correct	100%

Table 7. Assessment Results for SLO #7

Students were asked questions regarding this objective topic in their written exam. All questions were accurately answered.

Improvements for this learning outcome

We will continue doing what we are doing for this objective since we have shown positive results.

Student Learning Outcome #8: demonstrate the knowledge of site management.

This outcome was assessed through a comprehensive written exam that students took at the end of their third and final clinical practicum. This written exam was given on the OIT campus and students were required to be in residence.

Performance Criteria	Assessment Method	Measurement Scale	Minimum Acceptable Performance	Results
Demonstrated knowledge of site management	Mock exam	1 point per question	80% of answers correct	100%

Table 8. Assessment Results for SLO # 8

Analysis of Data

Students were asked questions regarding this objective topic in their written exam. All questions were accurately answered.

Improvements for this learning outcome

We will continue doing what we are doing for this objective since we have shown positive results.

Additional Direct Assessment Measures

Preceptor’s Checklist of all Program Outcomes

At the end of the term, preceptors submit a Preceptors Checklist which assesses students’ demonstrated ability to perform required skills and their personal interactions with patients. A compilation of this data is shown in Appendix B.

Analysis of Data

The clinical courses are a strong part of the program. Thus far, all of the students except one have had very rewarding experiences. The one student that had problems was taking the practicum on a part-time basis (9 hours a week). She was not catching on as quickly as her preceptors expected. As a result they terminated her placement. She was then placed with another lab. She continued to have problems and the lab manager gave her a deadline for completion which was sooner than she felt she could handle. Consequently she dropped out of the program. We also heard complaints from another lab where the student was going part-time. This student was progressing nicely but they did not want to have the internship extend out for 6 terms. As a result of these situations and requests by additional labs for shorter internships periods, we have retooled the practicum schedule. The standard internship schedule beginning fall of 2009 will be 27 hours a week for two ten week terms for full time students. Part-time students will be in the lab for 18 hours a week for three ten week terms. Which schedule the student follows, will be worked out between them and the clinical sites.

National Registry Exam

Analysis of Data

To date, only one graduate has taken and passed the exam. Based on just this one graduate we can say we have a 100% passage rate. There are five other graduates who are expected to sit for the exam by the end of this year. We do have a timing problem with the exam. The exam is typically offered within two weeks of the end of our term. Applications for the exam must be submitted together with completed transcripts four weeks prior to the test date. Students have not finished their courses by then so transcripts are not available. Graduates must wait 3 months to take the test.

Indirect Assessment Measures:

At the end of the program, the students complete a survey on their preparation for the program outcomes. The data results are shown in Appendix C.

Analysis of Data

Overall graduates felt that they were highly prepared for most of the required skill sets. Students felt least prepared to recognize cardiac arrhythmias. For all other skills, they felt either prepared or highly prepared. More time will need to be spent on cardiac arrhythmias. As noted above, the students were very successful in their course ECHO 227 Basic ECG Recognition and Testing but because they typically do not see the arrhythmias on a regular basis in the lab, they forget what they have learned.

Pre- and Post-Test Scores: Evidence of Student Learning

This evidence is drawn from the comparison of the pre and post test scores. Students took a pretest the first week of the program and the exact same test last week of the program. Below are the results together with their scores on the post course test which is a practice test from BRPT and their passage of the mock exam. In all cases there was significant improvement demonstrating student learning as a direct result of this program.

Student	Pretest scores	Post Test Score	Test Increase	Post course	Mock exam
1	35	100	65	70%	Passed
2	35	89	54	82%	Passed
3	33	96	63	90%	Passed
4	20	58	38	61%	Passed
Average	30.7	85.7	55		

V. Planned Program Improvements

Per the assessment activities above, the following improvements in learning outcomes will be implemented in 2009-010.

Student Learning Outcome #3: demonstrate the ability to accurately collect data and summarize clinical observations.

There was one problem area, the recognition of seizure activity. Although all of the students had seen tracings in books of seizure activity, none had actually seen it in the lab. Only two could accurately describe what it would look like. This will need to be covered in more detail in PSG 231.

Student Learning Outcome #4: demonstrate the ability to accurately analyze, interpret, and report data.

During PSG 254, the last segment of the practicum, more emphasis needs to be placed on calculating sleep statistics. All of the students performed well in the ECHO 227 Basic ECG Recognition and Testing course however they failed to remember the material. A review guide should be developed for the students to refresh their memories. The ECG course will be redesigned as described on page 6 to improve the ability of the students to learn and remember.

Student Learning Outcome #5: demonstrate a thorough understanding of normal and disordered sleep.

More emphasis will be placed on the weak areas of physiology and pharmacology. Additional assignments will be given focusing on sleep physiology and pharmacology.

VI. Changes Resulting From Assessment (Closing the Loop Items)

The program implemented the following improvements this year, including re-assessments as needed.

1. As a result of the feedback from the clinical sites and from the students, the length of the internship was changed from three terms to two, keeping the same number of total hours.
2. Students were very unhappy with the EET 100 Basic Electronics and Safety. There were numerous problems with the course that were not resolved after teaching it for two terms. Problems were: lack of mathematical preparedness on the part of the students, inability to get the materials needed for the laboratory aspects of the course in a timely fashion, poor online teaching skills of the instructor, and attitude of the students towards taking the course. To resolve the problem for the 2009-2010 school year, EET 100 will be replaced with PSG 246 Sleep Disorders in Women. The essential material from the electronics course will be added to the first clinical course. Some of that material is already being taught; it will just be emphasized and expanded upon.
3. There was a clear improvement this year over last year in how smoothly the courses ran. Bugs were worked out and the overall level of satisfaction with the program has improved. It remains to be seen yet how well the graduates perform on the national exam.
4. SLO #4 (ability to accurately analyze, interpret, and report data): Last year there were several identified weak areas in transitional and artifact issues. During the year greater emphasis was placed on recognizing stage transitions which caused students problems last year. These areas were re-assessed this year, and there is no longer a problem.
5. SLO #5 (understanding of normal and disordered sleep): Last year, there were weaknesses identified in physiology, scoring and instrumentation. Compared to last year, assessment showed that group scores had improved in staging and scoring with the additional emphasis on these areas this year. Instrumentation was also re-assessed and was not in issue in student learning. Physiology, as noted above, continues to be a problem.

Appendix A

Student Learning Outcome-Curriculum Matrices

Student Learning Outcome #1: demonstrate the ability to perform analysis of pre-testing information.

I = Introduced

R = Reinforced

E = Emphasized

	1 st year			2 nd year	
Fall	PSG 211	Fundamentals of PSG & Patient Care	I	BIO 231	Human Anatomy & Physiology I
	PSG 221	Physiology of Sleep		BIO 200	Medical Terminology
	PSG 252	Clinical PSGT I	E	WRI 121	English Composition
	ECHO 227	Basic ECG Recognition & Testing		SPE 111	Fundamentals of Speech
					M/S/SS Elective
Winter	PSG 231	Sleep Disorders pathology		BIO 232	Human Anatomy & Physiology II
	PSG 253	Clinical PSGT II	R	MATH 243	Introductory Statistics
	EET 100	Basic Electricity, Electronics & Safety		PSY 201	Psychology
				WRI 122	English Composition
					Hum. elective
Spring	PSG 254	Clinical PSGT III	R	BIO 233	Human Anatomy & Physiology III
	PSG 264	Pediatric / Neonatal PSG		WRI 227	Technical Report Writing
	RCP 231	Pulmonary Physiology			M/S/SS Elective
					Electives
	MOCK EXAM – RESIDENCY				

Student Learning Outcome #2: demonstrate the ability to accurately prepare the equipment and patient for data collection.

I = Introduced
 R = Reinforced
 E = Emphasized

	1 st year				2 nd year	
Fall	PSG 211	Fundamentals of PSG & Patient Care	I	BIO 231	Human Anatomy & Physiology I	
	PSG 221	Physiology of Sleep	I	BIO 200	Medical Terminology	
	PSG 252	Clinical PSGT I	E	WRI 121	English Composition	
	ECHO 227	Basic ECG Recognition & Testing		SPE 111	Fundamentals of Speech	
					M/S/SS Elective	
Winter	PSG 231	Sleep Disorders pathology		BIO 232	Human Anatomy & Physiology II	
	PSG 253	Clinical PSGT II	E	MATH 243	Introductory Statistics	
	EET 100	Basic Electricity, Electronics & Safety		PSY 201	Psychology	
				WRI 122	English Composition	
					Humanities elective	
Spring	PSG 254	Clinical PSGT III	R	BIO 233	Human Anatomy & Physiology III	
	PSG 264	Pediatric / Neonatal PSG		WRI 227	Technical Report Writing	
	RCP 231	Pulmonary Physiology			M/S/SS Elective	
					Electives	
	MOCK EXAM – RESIDENCY E					

Student Learning Outcome #3: demonstrate the ability to accurately collect data and summarize clinical observations.

I = Introduced

R = Reinforced

E = Emphasized

	1 st year				2 nd year	
Fall	PSG 211	Fundamentals of PSG & Patient Care		BIO 231	Human Anatomy & Physiology I	
	PSG 221	Physiology of Sleep	I	BIO 200	Medical Terminology	
	PSG 252	Clinical PSGT I	E	WRI 121	English Composition	
	ECHO 227	Basic ECG Recognition & Testing	R	SPE 111	Fundamentals of Speech	
					M/S/SS Elective	
Winter	PSG 231	Sleep Disorders pathology		BIO 232	Human Anatomy & Physiology II	
	PSG 253	Clinical PSGT II	E	MATH 243	Introductory Statistics	
	EET 100	Basic Electricity, Electronics & Safety		PSY 201	Psychology	
				WRI 122	English Composition	
					Humanities elective	
Spring	PSG 254	Clinical PSGT III	E	BIO 233	Human Anatomy & Physiology III	
	PSG 264	Pediatric / Neonatal PSG	R	WRI 227	Technical Report Writing	
	RCP 231	Pulmonary Physiology	R		M/S/SS Elective	
					Electives	
	MOCK EXAM – RESIDENCY E					

Student Learning Outcome #4: demonstrate the ability to accurately analyze, interpret, and report data.

I = Introduced
 R = Reinforced
 E = Emphasized

	1 st year				2 nd year	
Fall	PSG 211	Fundamentals of PSG & Patient Care		BIO 231	Human Anatomy & Physiology I	
	PSG 221	Physiology of Sleep		BIO 200	Medical Terminology	
	PSG 252	Clinical PSGT I		WRI 121	English Composition	
	ECHO 227	Basic ECG Recognition & Testing	I	SPE 111	Fundamentals of Speech	
					M/S/SS Elective	
Winter	PSG 231	Sleep Disorders pathology	I	BIO 232	Human Anatomy & Physiology II	
	PSG 253	Clinical PSGT II	R	MATH 243	Introductory Statistics	
	EET 100	Basic Electricity, Electronics & Safety		PSY 201	Psychology	
				WRI 122	English Composition	
					Humanities elective	
Spring	PSG 254	Clinical PSGT III	E	BIO 233	Human Anatomy & Physiology III	
	PSG 264	Pediatric / Neonatal PSG	R	WRI 227	Technical Report Writing	
	RCP 231	Pulmonary Physiology	R		M/S/SS Elective	
					Electives	
	MOCK EXAM – RESIDENCY E					

Student Learning Outcome #5: demonstrate a thorough understanding of normal and disordered sleep.

I = Introduced

R = Reinforced

E = Emphasized

	1 st year				2 nd year	
Fall	PSG 211	Fundamentals of PSG & Patient Care	I	BIO 231	Human Anatomy & Physiology I	
	PSG 221	Physiology of Sleep	I	BIO 200	Medical Terminology	
	PSG 252	Clinical PSGT I		WRI 121	English Composition	
	ECHO 227	Basic ECG Recognition & Testing		SPE 111	Fundamentals of Speech	
					M/S/SS Elective	
Winter	PSG 231	Sleep Disorders pathology	E	BIO 232	Human Anatomy & Physiology II	
	PSG 253	Clinical PSGT II	E	MATH 243	Introductory Statistics	
	EET 100	Basic Electricity, Electronics & Safety		PSY 201	Psychology	
				WRI 122	English Composition	
					Humanities elective	
Spring	PSG 254	Clinical PSGT III	E	BIO 233	Human Anatomy & Physiology III	
	PSG 264	Pediatric / Neonatal PSG	E	WRI 227	Technical Report Writing	
	RCP 231	Pulmonary Physiology			M/S/SS Elective	
					Electives	
MOCK EXAM – RESIDENCY E						

Student Learning Outcome #6: demonstrate the ability to apply standard precautions throughout the patient's evaluation in order to prevent the spread of infection to patients and staff.

I = Introduced

R = Reinforced

E = Emphasized

	1 st year				2 nd year	
Fall	PSG 211	Fundamentals of PSG & Patient Care	I	BIO 231	Human Anatomy & Physiology I	
	PSG 221	Physiology of Sleep		BIO 200	Medical Terminology	
	PSG 252	Clinical PSGT I	E	WRI 121	English Composition	
	ECHO 227	Basic ECG Recognition & Testing		SPE 111	Fundamentals of Speech	
					M/S/SS Elective	
Winter	PSG 231	Sleep Disorders pathology		BIO 232	Human Anatomy & Physiology II	
	PSG 253	Clinical PSGT II	R	MATH 243	Introductory Statistics	
	EET 100	Basic Electricity, Electronics & Safety	E	PSY 201	Psychology	
				WRI 122	English Composition	
					Humanities elective	
Spring	PSG 254	Clinical PSGT III	R	BIO 233	Human Anatomy & Physiology III	
	PSG 264	Pediatric / Neonatal PSG		WRI 227	Technical Report Writing	
	RCP 231	Pulmonary Physiology	R		M/S/SS Elective	
					Electives	
MOCK EXAM – RESIDENCY E						

Student Learning Outcome #7: demonstrate the knowledge of how to provide patient support and educational information.

I = Introduced

R = Reinforced

E = Emphasized

	1 st year				2 nd year	
Fall	PSG 211	Fundamentals of PSG & Patient Care	I	BIO 231	Human Anatomy & Physiology I	
	PSG 221	Physiology of Sleep		BIO 200	Medical Terminology	
	PSG 252	Clinical PSGT I		WRI 121	English Composition	
	ECHO 227	Basic ECG Recognition & Testing		SPE 111	Fundamentals of Speech	
					M/S/SS Elective	
Winter	PSG 231	Sleep Disorders pathology		BIO 232	Human Anatomy & Physiology II	
	PSG 253	Clinical PSGT II		MATH 243	Introductory Statistics	
	EET 100	Basic Electricity, Electronics & Safety		PSY 201	Psychology	
				WRI 122	English Composition	
					Humanities elective	
Spring	PSG 254	Clinical PSGT III	E	BIO 233	Human Anatomy & Physiology III	
	PSG 264	Pediatric / Neonatal PSG		WRI 227	Technical Report Writing	
	RCP 231	Pulmonary Physiology			M/S/SS Elective	
					Electives	
MOCK EXAM – RESIDENCY E						

Student Learning Outcome #8: demonstrate the knowledge of site management.

I = Introduced

R = Reinforced

E = Emphasized

	1 st year				2 nd year	
Fall	PSG 211	Fundamentals of PSG & Patient Care	I	BIO 231	Human Anatomy & Physiology I	
	PSG 221	Physiology of Sleep		BIO 200	Medical Terminology	
	PSG 252	Clinical PSGT I		WRI 121	English Composition	
	ECHO 227	Basic ECG Recognition & Testing		SPE 111	Fundamentals of Speech	
					M/S/SS Elective	
Winter	PSG 231	Sleep Disorders pathology		BIO 232	Human Anatomy & Physiology II	
	PSG 253	Clinical PSGT II		MATH 243	Introductory Statistics	
	EET 100	Basic Electricity, Electronics & Safety		PSY 201	Psychology	
				WRI 122	English Composition	
					Humanities elective	
Spring	PSG 254	Clinical PSGT III	E	BIO 233	Human Anatomy & Physiology III	
	PSG 264	Pediatric / Neonatal PSG		WRI 227	Technical Report Writing	
	RCP 231	Pulmonary Physiology			M/S/SS Elective	
					Electives	
	MOCK EXAM – RESIDENCY E					

Appendix B
Preceptor's Checklist for all Program Outcomes

At the end of the term, preceptors submit a Preceptors Checklist which assesses students' demonstrated ability to perform required skills and their personal interactions with patients for all outcomes. A compilation of this data is shown below.

Performance Criteria	07-08	08-09
Preceptor Checklist ratings (1160 total possible points, 928 points is 80%) average score	1016	1092
Difference in Pre/Post Test scores	59	55
Post Program Exam Score Average	77.5	75.7
Scoring Exam P/F ratios	2/0	4/0
Did student pass the national registry exam? P/F ratios	1/1	None taken

Appendix C
2008-09 Post Program Student Self-Evaluation Summary

At the end of the program, the students complete a survey on their preparation for the program outcomes. A summary of this data is shown below. Four students completed this assessment this year.

SLO refers to “Student Learning Outcomes”

Performance Criteria	Unprepared	Somewhat Prepared	Prepared	Highly prepared
SLO #1 Demonstrate the ability to perform analysis of pre-testing information.				
Identify accurate & inaccurate test requests				4
Identify appropriate testing methods used				4
Identify external factors affecting testing				4
SLO#2 Demonstrate the ability to accurately prepare the equipment and patient for data collection.				
Performance Criteria	Unprepared	Somewhat Prepared	Prepared	Highly prepared
Accurately calibrate computers used for data acquisition.				4
Select proper settings based on physician orders and best practices.			1	3
Determine correct montage and accurately apply equipment.				4
Correctly interface ancillary equipment to primary recording computer.				4
Correctly apply ancillary equipment to patient				4
Correctly conduct physiological calibrations and correct problems.				4
Demonstrate proper patient communications				4
SLO#3 Demonstrate the ability to accurately collect data and summarize clinical observations.				
Performance Criteria	Unprepared	Somewhat Prepared	Prepared	Highly prepared
Recognize and visually discriminate appropriate waveforms from instrument artifact			2	2
Make appropriate alternations to recording parameters			2	2
Correctly identify how to recognize and respond to clinically significant events and emergency situations			2	2
Follow protocols				4
Correctly identify how to titrate PAP/O2			1	3
Correctly identify how to recognize and			2	2

respond to seizures				
Correctly identify how to perform CPR			1	3
Apply CPAP interfaces and interventional equipment				4
SLO#4 Demonstrate the ability to accurately analyze, interpret, and report data.				
Performance Criteria	Unprepared	Somewhat Prepared	Prepared	Highly prepared
Identify sleep stages			2	2
Identify wake, arousals, body movements and movement time			1	3
Recognize and visually discriminate appropriate waveforms from instrument artifact			2	2
Document SaO ₂ and CO ₂ changes,				4
Document sleep apnea & hypopnea				4
Identify limb movements (e.g., periodic, restless legs, fragmentary myoclonus)			1	3
Recognize cardiac arrhythmias		1	1	2
Calculating all sleep statistics			3	1
SLO#5 Demonstrate a thorough understanding of normal and disordered sleep.				
Performance Criteria	Unprepared	Somewhat Prepared	Prepared	Highly prepared
Demonstrated knowledge of all characteristics of normal sleep			1	3
Demonstrated knowledge of the characteristics of the various sleep disorders			3	1
SLO#6 Demonstrate the ability to apply standard precautions throughout the patient's evaluation in order to prevent the spread of infection to patients and staff.				
Performance Criteria	Unprepared	Somewhat Prepared	Prepared	Highly prepared
Demonstrate knowledge of standard safety precautions to prevent the spread of infection				4
SLO#7 Demonstrate the knowledge of how to provide patient support and educational information.				
Performance Criteria	Unprepared	Somewhat Prepared	Prepared	Highly prepared
Demonstrate knowledge of providing patient support and educational information				4
SLO#8 Demonstrate the knowledge of site management.				
Performance Criteria	Unprepared	Somewhat Prepared	Prepared	Highly prepared
Demonstrate knowledge of site management			1	3