Syllabus Elective Child Neurology

<table>
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<tr>
<th>Course No.:</th>
<th>OM 7550A-G</th>
<th>Course Title:</th>
<th>Elective Child Neurology</th>
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<tbody>
<tr>
<td>Credit Hours:</td>
<td>2-4 weeks, 2-4 credit hours for each rotation</td>
<td>Chair: Clerkship director:</td>
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<tr>
<td>Term - Dates:</td>
<td>Variable in OMS IV academic year</td>
<td>Level: OMS III (if approved), IV</td>
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</tbody>
</table>

Department of Clinical Education Contact Information

FOR POMONA CAMPUS
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Educational Goal

This elective rotation is a two-four (2-4) week introductory, structured clinical experience under direct supervision designed to provide the student experience diagnosing, treating and caring for patients with child neurological disorders. There is no post-rotation exam for the elective. Most students electing to take this rotation will be in the fourth year of osteopathic medical school.

Purpose
Clinical experiences are intended to assist the student’s transition from didactic to integrated clinical evaluation and patient management. The goals of this rotation are to prepare the student to recognize common acute and chronic child neurological disorders. The student should further understand the causes, prevention, and appropriate treatment options for those disorders. The student should also
develop fundamental psychomotor skills by performing routine basic procedures under direct supervision.

Students will become familiar with the diagnosis and management of most inpatients and outpatients seen by the Child Neurologist. All patient care is directly supervised by attendings. This includes a basic understanding of the uses of neurodiagnostic tests, including but not limited to electrophysiological and neuroradiological techniques, metabolic tests, muscle biopsy, and Tensilon testing. The student will gain exposure to neuroophthalmology, neurosurgery, neurooncology, pediatric rehabilitation, medical genetics, pediatric orthopedics, and child psychiatry. The student will develop a basic understanding of the uses of psychometric and neuropsychological testing in child neurology.

### Elective Child Neurology Clerkship Learning Objectives

The College recognizes that two-four (2-4) weeks is insufficient time to cover a comprehensive list of objectives; experience gained is dependent on the numbers of patients and types of disease entities presenting to a particular clinic. Nevertheless, certain minimum content must be addressed, either by clinical exposure or by didactic material to assist the student in preparing for national Board examinations and other evaluation measures. The following AOA competencies have been incorporated into the objectives: Osteopathic Principles and Practice, Medical Knowledge, Patient Care, Interpersonal and Communication Skills, Professionalism, Practice-Based Learning and Improvement, and Systems-Based Practice.

By the end of the Child Neurology elective, the student will have basic knowledge and skill:

1. In the diagnosis and management of both common and rare neurological conditions affecting neonates, children and adolescents.
2. In basic neurological science including but not limited to neurophysiology, neuropharmacology, neuroanatomy, neuroendocrinology, neuropathology and neurogenetics.
3. In specific skills needed in the practice of neurology, including, but not limited to clinical electrophysiology (EEG, EMG, NCVs, evoked potential studies), neuroradiology, neuropathology, psychiatry, neuroophthalmology.
4. In the appropriate management and application of ancillary therapies such as pediatric neurorehabilitation, neuropsychological and psychometric testing, physical therapy, occupational therapy, speech therapy, behavior modification.
5. In understanding the ethical issues involved in the care of pediatric patients, including end of life issues, termination of support in severely brain injured individuals, and choices regarding palliative care.
6. In normal, variant normal and abnormal child development.
7. In use of community resources, particularly for handicapped children and adolescents, including, but not limited to schools, Regional Centers, public programs for supportive care and therapy, and community voluntary organizations.
8. In understanding how health care financing impacts upon both the practice of child neurology and upon resources and services available for our patients, and to have them learn skills to negotiate this increasingly challenging system. The Child neurology resident will learn to informally assess cost-effectiveness of various modalities of care, particularly to be able to decide between various options.
9. In developing exceptionally good communication skills, both with patients, parents, hospital staff and colleagues in and out of the hospital.

### Core Topics of Study

The Student will be expected to develop an understanding in the evaluation and management of the following groups of diagnoses, including the appropriate use of diagnostic tests and interpretation of results, use of medications, referral to consultants, and use of appropriate non-medical community resources:

**Paroxysmal disorders:**
The student will develop a basic understanding of the diagnosis including history, physical and neurological examination, use of laboratory testing, and interpretation of results of electrophysiological testing such as EEG, EKG, neuroimaging.

Including but not limited to:
- Symptomatic seizures (febrile, other)
- Epilepsy, with particular emphasis on conditions specific to childhood
- Neonatal seizures
- Infantile Spasms
- Age-specific epilepsies such as childhood absence, benign focal epilepsies, JME Symptomatic secondary epilepsies
- Genetic syndromes such as tuberous sclerosis, malformations, Angelman's syndrome, Rett Syndrome, progressive myoclonic epilepsies
- Degenerative diseases with epilepsy as a major feature
- Syncope, including differential diagnosis and distinction from seizures
- Breath holding spells

**Developmental disorders:**
The student will develop a basic understanding of the diagnostic and evaluation techniques which apply to the following clinical problems, will be able to select appropriate diagnostic laboratory tests, and interpret results. The student will gain exposure to the various patterns of both normal, variants of normal, and abnormal development, differentiating "delayed" from abnormal patterns of development. The student will gain knowledge in the uses of psychometric and neuropsychological testing, but is not expected to be able to interpret test data independent of the psychologist's reports.

Including but not limited to:
- Mental retardation, whether of diagnosable or non-specific cause, including the common brain malformation syndromes, chromosomal syndromes, dysmorphologic syndromes
- Cerebral palsy and related disorders
- Autism and related disorders
- Neurodegenerative diseases
- Learning and language disabilities
- Attention deficit disorder

**Neuromuscular disorders:**
The student will develop a basic understanding of the differential diagnosis, laboratory evaluation,
understanding of the uses and interpretation of results of specialized testing such as EMG, NCV, muscle biopsy (although not expected to be able to perform these tests at this level of training). The student will be introduced to the uses of DNA diagnostic testing in neuromuscular disorders. The student will develop a basic understanding of the treatment and management techniques appropriate to neuromuscular disorders.

Including but not limited to:
Muscular dystrophies
Acquired and congenital myopathies
Acquired and genetic neuropathies
Guillain-Barre syndrome
Mitochondrial disorders
Myotonic dystrophy (congenital and childhood onset forms)
Spinal muscular atrophy
Myasthenia gravis

**Tumors of the CNS:**
The student will develop a basic understanding of the diagnosis and neurological management of childhood brain and spinal cord tumors, interacting with neurosurgeons, oncologists, neuroradiologists, neuropathologists. Students will gain basic understanding and familiarity with the neuroimaging characteristics of various childhood brain tumors, the neuropathology of common childhood brain tumors. The student is expected to gain some familiarity with chemotherapy and radiation therapy of childhood brain tumors in a generic sense (i.e. which tumor types are treated with each), but is not expected to know specific protocols. The student is expected to be familiar with the neurological complications, both acute and long term, of chemotherapy and radiation therapy.

**Neurological emergencies:**
The student will develop a basic understanding of the diagnosis and management of common neurological emergencies in children presenting to emergency room, as inpatients, and in clinic, including, but not limited to:
Status epilepticus and acute seizures
Altered mental status, including encephalopathies, intoxications
Weakness (diffuse or focal), gait disturbance, myelopathy, Guillain-Barre, etc
Acute ataxias
Neurological aspects of acute hypoxic-ischemic encephalopathies including drowning, SIDS
Neurologic infections including suspected or proven encephalitis, meningitis, abscess, cysticercosis, etc.
The student will become familiar with the neurologic aspects of child abuse and neglect, including inflicted injuries and "shaken baby syndrome".

**Movement disorders:**
The student will develop a basic understanding of the diagnostic evaluation, and basic treatment of childhood movement disorders including but not limited to:
Tic disorders
Tourette Syndrome
Choreoathetosis
Dystonias

**Headache and migraine:**
The student will develop a basic understanding of the various types of headache and migraine disorders.
in children and adolescents, including understanding the differential diagnosis, evaluation, pharmacological and non-pharmacological treatment.

**Neurological aspects of rehabilitation:**
The student will develop a basic understanding of pediatric acute neurorehabilitation patients including interaction with appropriate specialists and therapists. Diagnostic groups include but are not limited to:
- Closed head injury
- Post-infectious neurological dysfunction (encephalopathies, encephalitis, meningitis, etc)
- Hypoxic-ischemic encephalopathies, such as drowning, SIDS, post-cardiac arrest.
- Post-operative neurosurgical patients requiring neurorehab including brain tumor patients.
- Childhood stroke
- Neurological aspects of acute rehabilitation of child with neuromuscular disease, recent orthopedic procedures, etc.

**Childhood stroke:**
The student will develop a basic understanding of the evaluation, appropriate interventions and interact with associated services such as rheumatology, neurosurgery, neuroradiology, hematology and coagulation disorders for children with cerebrovascular disease including but not limited to:
- Ischemic stroke
- Hypercoagulable states
- Hemorrhagic stroke
- Cerebral vasculitis

**Neurogenetic/neurodegenerative diseases:**
The student will develop a basic understanding of neurogenetic diseases. Examples include, but are not limited to:
- Inborn errors of metabolism such as non-ketotic hyperglycinemia, homocysteinuria, methylmalonic aciduria, PKU
- Lysosomal storage diseases such as Tay-Sachs, Krabbe, MLD, etc
- Peroxisomal diseases such as ALD, neonatal ALD, Zellweger's syndrome, Refsum disease, etc.
- Mitochondrial diseases and conditions suspected to be due to mitochondrial dysfunction including Leigh Syndrome, Kearn-Sayer Syndrome, mitochondrial cytopathies.
- Disorders of metal metabolism such as Wilson Disease, Menke Syndrome

**Developmental disorders, learning disabilities, autism, ADHD**
The student will develop a basic understanding of the evaluation and management of complex learning and language disorders, including in the interpretation of psychometric and neuropsychological testing reports.

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**Rotation Faculty**

**OAA Administrative Support:**
**Pomona:**
*Marisa Orser, M.Ed, Assistant Director of Clinical Education and Rotations Department (909) 469-5253*
*Desiree Inglis, Lead Rotations Coordinator*
Lebanon:
Linda Martin, M.Ed, Manager of Clinical Education and Rotations Office (541) 259-0212

Texts and Media

It is strongly recommended that students spend approximately 10 hours per week reading independently. Students should not rely solely on the review books to be adequately prepared for the rotation as they do not provide the knowledge base needed to successfully pass the rotation.
READING ASSIGNMENTS
1. Review all core topics and diseases listed above.
2. Supplemental readings are encouraged to augment pathology seen in child neurology. Students must make a concerted effort to read supportive material to assist in achieving the goals and objectives of the rotation.

Recommended Texts/Reading:

**Pediatric Neurology:**
Pediatric Neurology: A Case-Based Review, Tena Rosser, MD
Fenichel GM. Clinical Pediatric Neurology; A signs-and-symptoms-based approach
Journal of Pediatric Neurology

**General Neurology**
Glick, T. Neurologic skills: examination and diagnosis
Rowland, L. Merritt’s Textbook of Neurology.
Biller J. Practical Neurology
Mayo Clinic. Clinical Examination in Neurology
Rolak L. Neurology Secrets.

**Cerebrovascular and Critical Care Neurology**
Wijicks, E. The clinical practice of critical care neurology.

**Neuroanatomy**

**Neuropathology**

**Neuropharmacology**
Cooper, J. Bloom, F. Roth, R. The Biochemical Basis of Neuropharmacology.
Rowland, L. Klein, D. Current Neurologic Drugs.

**EMG/ Neuromuscular**
Preston DC., Shapiro BE. Electromyography and Neuromuscular Disorders. Elsevier
Balliere T. Aids to the Examination of the Peripheral Nervous System.

**EEG/Epilepsy**
Fisch, B. Spehlmann’s EEG Primer
Dale, D. Pedley, T. Current Practice of Clinical Electroencephalography

**Behavioral Neurology**
Mesulam M-M. Principles of Behavioral Neurology,
Strub, R. Black, F. The Mental Status Examination in Neurology.
Kaplan, H. Sadock, B. Synopsis of Psychiatry, Behavioral Sciences, Clinical Psychiatry.
Evidence-Based Medicine:
• ACP's PIER- Stat! Ref- PIER© is a collection of over 400 evidence summaries published by the American College of Physicians. Each module provides authoritative guidance to improve the quality of care.
• Cochrane Library for Evidence-Based Medicine- The Cochrane Library contains high-quality, independent evidence to inform healthcare decision-making.
• DynaMed- Point-of-care reference resource designed to provide doctors and medical researchers with the best available evidence to support clinical decision-making.
• Essential Evidence Plus- A powerful resource packed with content, tools, calculators and alerts for clinicians who deliver first-contact care.
• ACP Medicine- ACP Medicine is a comprehensive, evidence-based reference for fast, current answers on the best clinical care.

Electronic Texts:
• Cecil Medicine-MD Consult
• Harrison's Online-AccessMedicine
• Current Medical Diagnosis and Treatment 2011 -AccessMedicine
• MD Consult- Provides full-text access to approximately 40 medical textbooks, 50 medical journals, comprehensive drug information, and more than 600 clinical practice guidelines
• Ebsco A-to-Z- Database provides links and coverage information to more than 124,000 unique titles from more than 1,100 database and e-journal packages.
• The Medical Letter on Drugs and Therapeutics- An independent, peer-reviewed, nonprofit publication that offers unbiased critical evaluations of drugs, with special emphasis on new drugs.

Rotation Format, Evaluation, Grading, and Student Feedback

Refer to the Clinical Education Manual for policies and procedures. Additional information is located in the Clinical Education Manual at: http://www.westernu.edu/bin/ime/cem-2014.pdf

Rotation Schedule
Each site will provide students with a schedule on their first day of the rotation. These schedules are rarely available prior to the start the rotation.

Expectations:
During this rotation, the student is expected to do the following:

1. Function as an essential member of the office team.
2. Report to the office daily. If you are going to be late or absent, you must notify the resident or attending that you are assigned to and the WesternU/COMP Rotations Office.
3. Report to the resident or attending physician you are assigned to daily. They will assign patients for you to take care of during your rotation.
4. Write progress notes and orders as allowed by the attending physician.
5. Attend all educational conferences and grand rounds as required by the resident or attending physician.
6. Read about the anatomy, physiology, and pathology of the patients encountered in the required textbooks.
7. Complete the assigned reading.
8. Apply osteopathic principles and practices to every patient.
Evaluations:

The evaluation of the student is based upon, but not limited to the following:

1. Knowledge of Child Neurology disease, pathology, and management for assigned patients.
3. Presentation of assigned patients.
4. Completion of paperwork (history and physicals, progress notes, orders, etc) on assigned patients.
5. Performance of an independent presentation as assigned by the resident or attending physician.
6. Professionalism and rapport with patients, residents, attendings, and ancillary staff.
7. Attendance at lectures, conferences, and meetings.
8. Submission of completed case log and procedure log in New Innovations. Failure to submit the logs will count as failure to complete the clerkship.

Implementation
Course objectives are to be accomplished under supervision. Course objectives should be covered during the rotation to assure adequate student preparation for board examinations and clinical practice. The use of diverse methods appropriate to the individual and the clinical site are encouraged, but patient-centered teaching is optimal.

Didactic methods to achieve required objectives include:
- Reading assignments
- Lectures
- Computer-assisted programs (if available)
- Student attendance at/participation in formal clinical presentations by medical faculty

Clinically oriented teaching methods may include:
- Assignment of limited co-management responsibilities under supervision
- Participation in clinic visits, daily patient rounds and conferences
- Supervised and critiqued clinic work-ups of patients admitted to the service
- Assigned, case-oriented reading and case presentations

DOCUMENTATION

A. PATIENT ENCOUNTERS
Students are required to document each patient encounter in a case log on New Innovations. Failure to submit the log will count as failure to complete the clerkship.

B. PROCEDURES
Students are also required to document each procedure performed in a procedure log on New Innovations.

KEYS TO SUCCESS:
1. READ, READ, READ!!!!!! It is imperative that you read for this clerkship. If you read the required text, it will make it easier for you to understand the medical management of your patients and to answer questions from your resident and attendings.
2. Know your patients well. Read up on the disease process of your patients, which includes diagnosis and treatment. These practices will help you understand the manifestation of the disease process and why certain treatment modalities are being used.

3. Practice and learn how to orally present patients. This will be a skill that you will use for all rotations and will have to master as a physician.

There is no post-rotation examination for this rotation. At the beginning of the rotation, the physician/mentor should review expectations/guidelines of performance with the student. On the last day of service, the supervising physician should review the student’s performance with the student and have the student review the evaluation form before submission.

General Policies

**Policy on Disability Accommodations:** To obtain academic accommodations for this rotation, students with disabilities should contact the Harris Family Center for Disability and Health/Accommodation and Resource Center (CDHP/AARC) and the system coordinator within ten days of the beginning of the system. Disability Services can be reached at 909.469.5380.


**Academic Dishonesty:** Complete confidence in the honor and integrity of the health professions student and health care professional is essential. Such confidence depends entirely on the exemplary behavior of the individual health care provider in his or her relations with patients, faculty and colleagues. Strict honesty as a personal way of life should be nurtured during the period of education for professional service. The student shall conduct all aspects of his or her life with honor and integrity. This includes accountability to oneself and to relationships with fellow students, future colleagues, faculty, and patients who come under the student’s care or contribute to his or her training and growth, and members of the general public. This applies to personal conduct that reflects on the student’s honesty and integrity in both academic and non-academic settings, whether or not involving a University sponsored activity. Upon accepting admission to the University, each student subscribes to and pledges complete observance to the Standards of Academic and Professional Conduct as outlined in the University Catalog for each academic program. A violation of these standards is an abuse of the trust placed in every student and could lead to suspension or dismissal.

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<thead>
<tr>
<th>WU INSTITUTIONAL OUTCOMES</th>
<th>Health Professional Education</th>
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<tbody>
<tr>
<td>1. Critical Thinking</td>
<td>The graduate should be able to identify and solve problems that require the integration of multiple contexts when performing patient care.</td>
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<tr>
<td>2. Breadth and Depth of Knowledge in the</td>
<td>The graduate should be able to perform appropriate diagnostic and therapeutic skills, to apply relevant information to patient care and practice,</td>
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<tr>
<td>Discipline/Clinical Competence</td>
<td>and to educate patients regarding prevention of common health problems.</td>
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<td>3. Interpersonal Communication Skills</td>
<td>The graduate should be able to effectively use interpersonal skills that enable them to establish and maintain therapeutic relationships with patients and other members of the health care team.</td>
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<td>4. Collaboration Skills</td>
<td>The graduate should be able to collaborate with clients and with other health professionals to develop a plan of care to achieve positive health outcomes for their patients.</td>
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<td>5. Ethical and Moral Decision Making Skills</td>
<td>The graduate should be able to perform the highest quality of care, governed by ethical principles, integrity, honesty and compassion.</td>
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<td>6. Life-Long Learning</td>
<td>The graduate should be able to engage in life-long, self-directed learning to validate continued competence in practice.</td>
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<td>7. Evidence-Based Practice</td>
<td>The graduate should be able to utilize research and evidence-based practice and apply relevant findings to the care of patients.</td>
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<tr>
<td>8. Humanistic Practice</td>
<td>The graduate should be able to carry out compassionate and humanistic approaches to health care delivery when interacting with patients, clients, and their families. They should unfailingly advocate for patient needs.</td>
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**COMP/AOA CORE COMPETENCIES**

**Competency: Osteopathic Medical Students are part of an educational continuum that leads to residency and the curriculum provides the foundation for the following outcomes:**

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<tr>
<th>Competency</th>
<th>Description</th>
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<tbody>
<tr>
<td>1. Osteopathic Philosophy and Osteopathic Manipulative Medicine</td>
<td>Residents are expected to demonstrate and apply knowledge of accepted standards in Osteopathic Manipulative Treatment (OMT) appropriate to their specialty. The educational goal is to train a skilled and competent osteopathic practitioner who remains dedicated to life-long learning and to practice habits in osteopathic philosophy and manipulative medicine.</td>
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<tr>
<td>2. Medical Knowledge</td>
<td>residents are expected to demonstrate and apply knowledge of accepted standards of clinical medicine in their respective specialty area, remain current with new developments in medicine, and participate in life-long learning activities, including research.</td>
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<td>3. Patient Care</td>
<td>residents must demonstrate the ability to effectively treat patients, provide medical care that incorporates the osteopathic philosophy, patient empathy, awareness of behavioral issues, the incorporation of preventative medicine, and health promotion.</td>
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<tr>
<td>4. Interpersonal and Communication Skills</td>
<td>residents are expected to demonstrate interpersonal/communication skills that enable them to establish and maintain professional relationships with patients, families, and other members of health care teams.</td>
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<td>5. Professionalism</td>
<td>residents are expected to uphold the Osteopathic Oath in the conduct of their professional activities that promote advocacy of patient welfare, adherence to ethical principles, collaboration with health professionals, life-long learning, and sensitivity to a diverse patient population. residents should be cognizant of their own physical and mental health in order to effective care for patients.</td>
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<tr>
<td>6. Practice-Based Learning and Improvement</td>
<td>residents must demonstrate the ability to critically evaluate their methods of clinical practice, integrate evidence-based medicine into patient care, show an understanding of research methods, and improve patient care practices.</td>
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7. **Systems-based Practice**

Residents are expected to demonstrate an understanding of health care delivery systems, provide effective and qualitative patient care within the system, and practice cost-effective medicine.

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<tr>
<th>COMPARISON OF OUTCOMES STANDARDS: WU AND COMP</th>
<th>WU</th>
<th>COMP</th>
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<tbody>
<tr>
<td>Critical Thinking</td>
<td>1</td>
<td>1, 2, 3, 6</td>
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<tr>
<td>Breadth and Depth of Knowledge in the Discipline/Clinical Competence</td>
<td>2</td>
<td>1, 2, 3, 4, 5, 6, 7</td>
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<tr>
<td>Interpersonal Communication Skills</td>
<td>3</td>
<td>4</td>
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<tr>
<td>Collaboration Skills</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Ethical and Moral Decision Making Skills</td>
<td>5</td>
<td>1, 3, 5, 6</td>
</tr>
<tr>
<td>Life Long Learning</td>
<td>6</td>
<td>1, 2, 3, 6, 7</td>
</tr>
<tr>
<td>Evidence-Based Practice</td>
<td>7</td>
<td>1, 2, 3, 6, 7</td>
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<tr>
<td>Humanistic Practice</td>
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<td>3, 4, 5</td>
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