

## THE CURRICULUM GUIDE FOR ORTHOTIC/PROSTHETIC EDUCATION

### Introduction

This *core curriculum guide* contains the prerequisite education requirements and the professional education constructs that a master's level orthotic/prosthetic education program must meet. The professional curriculum content requirements are presented as expected student outcomes. Educational program faculty members are responsible for developing learning activities and evaluation methods to document that students graduating from the respective institutions meet these outcomes.

The Profession. The orthotist/prosthetist is a health professional educated to provide and manage an individual's orthotic and prosthetic care based on his or her own clinical assessment and a licensed health care provider's prescription or referral. Orthotists/prosthetists provide assessment and services to those with the absence or deficiency of an extremity, those lacking motor control or strength, and those with musculoskeletal or neurological abnormalities or deficits. Orthotists/prosthetists are skilled professionals whose knowledge and abilities bridge the biological, medical and social sciences. They provide the patient/client with comprehensive orthotic and prosthetic care. This care is intended to improve the individual's well being by improving ambulation, increasing function, preventing or reducing deformity, or reducing pain.

Accreditation. The Commission on Accreditation of Allied Health Education Programs (CAAHEP) accredits educational programs as recommended by the committee on accreditation, the National Commission on Orthotic and Prosthetic Education (NCOPE). The accredited programs provide entry-level educational preparation for the potential orthotist/prosthetist.

The entry-level orthotist/prosthetist is required to possess and demonstrate basic skills as a health care provider in conjunction with the skills unique to the professions. Additionally, the entry-level professional should have sufficient preparatory education and skills for continuing professional development as a consultant, educator and manager.

In order to fully operationalize these skills, the entry-level orthotist/prosthetist must:

- have achieved entry-level competence through a combination of academic and clinical education;
- be prepared to uphold the clinical standards and values of the orthotics/prosthetics profession; and
- be an effective consumer of knowledge and research sufficient to support evidence-based clinical practice, while contributing in the continuing growth and development of the profession.

## SECTION A: CURRICULUM STRUCTURE/Framework

The curriculum must be designed to prepare participating learners for entry-level practice as orthotists/prosthetists, including broad exposure to current practice procedures and settings. A foundation in the biological, physical, social and behavioral sciences prepares learners to work with a variety of populations.

- A.1.0 The curriculum design, including program planning, implementation and evaluation, shall reflect the mission and philosophy of the orthotics/prosthetics program, the sponsoring institution and the expectations of the profession.
- A.1.1 The curriculum design is the responsibility of the sponsoring institution and shall identify: educational and instructional objectives; course content and sequencing of classroom, laboratory and clinical learning experiences; and evaluation methods.
- A.1.2 The program administration shall assure that each student is provided a clear written description of the overall program design and its content, including supervised clinical practice experiences and competencies/requirements for graduation. The program administration must further assure that each learning experience is clearly described in a written syllabus that includes instructional objectives and associated laboratory activities, in situ and external, that reflect the composite learning. Programs must demonstrate consistency between the curriculum design and the syllabi for all planned learning experiences.
- A.1.3 To accomplish the requisite integration of knowledge, theory and application of the clinical and technical aspects of the disciplines, it is recommended that a variety of instructional methods be employed, including instructor presentations and demonstrations, interactive experiences, Internet-based assignments, self-directed activities, structured laboratory experiences and supervised clinical experiences.
- A.1.4 The program must be of sufficient length to address the projected content and expected student outcomes required for entry-level competence of the orthotist/prosthetist. It is strongly recommended that the program consist of a minimum 60 semester credits or the equivalent. Actual program **duration** may vary depending on institutional policy or state laws and regulations. It is the program's responsibility to justify the length as necessary to meet the standards outlined in this document.

### **A.2.0 ENTRY-LEVEL COMPETENCIES**

The graduate entering the profession shall effectively demonstrate competence in the following constructs.

- A.2.1 Exemplify the role of the orthotist/prosthetist in providing ethical patient/client-centered care by applying the ABC Code of Professional Responsibilities in clinical practice experiences.
- A.2.2 Practice safety of self and others, and adhere to safety procedures throughout the delivery of orthotic/prosthetic services.
- A.2.3 Demonstrate an awareness of the humanity and dignity of all patients/clients and related individuals within a diverse and multicultural society.
- A.2.4 Demonstrate appropriate insight of clinical practice, clinical operations and practice management within the social, cultural, and economic constructs of human function and disability.
- A.2.5 Comprehend and demonstrate knowledge of the collaborative role of the orthotist/prosthetist as a member of the interdisciplinary rehabilitation team in providing patient/client-centered care.
- A.2.6 Demonstrate the ability to participate as a critical consumer of research and to integrate research findings as evidence in clinical practice.
- A.2.7 Demonstrate the ability to integrate knowledge of the fundamental science in human function (physically, cognitively, socially, psychologically) with the practice framework of assessment, formulation, implementation and follow-up of a comprehensive orthotic/prosthetic treatment plan.
- A.2.8 Demonstrate the ability to make clinical decisions designed to meet patient/client expectations, as well as achieve prescribed orthotic or prosthetic outcomes.
- A.2.9 Demonstrate, in a systematic and effective manner, the ability to impart knowledge when providing learning services for patients/clients and their families, other health professionals and the public at large.
- A.2.10 Demonstrate the ability to participate in research activities through a working knowledge of the research process.
- A.2.11 Document pertinent information in a manner that promotes efficient direction for patient/client care, supports effective collegial communication, and meets the requirements of legal, business and financial constraints.
- A.2.12 Demonstrate proficiency in clinical and technical procedures that support the orthotic/prosthetic practice.

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**NOTE:** *The 21 competencies for health professionals, as articulated by the PEW Commission, are strongly recommended for graduates of orthotic and prosthetic master's degree programs.  
(See Appendix A)*

## **SECTION B: PREREQUISITES**

### **B.1.0 PREREQUISITE CONTENT REQUIREMENTS**

Successful completion of the following courses is considered *prerequisite* for entry into the professional course of study in orthotics and prosthetics. This grouping of prerequisites provides some of the strategic knowledge, behaviors and skills required of learners prior to admission into the professional component.

NOTE: The remaining preprofessional learning experiences should be determined according to the requirements of the school where study is completed.

#### B.1.1. Prerequisites:

- Life Sciences/Biology with lab
- Human Growth and Development or Abnormal Psychology
- Chemistry with lab
- Physics with lab
- Human Anatomy and Physiology with lab
- Statistics

#### Recommended:

- Business Management
- Ethics

## **SECTION C: PROFESSIONAL CURRICULUM**

The professional curriculum portion is the academic “core” of the curriculum and is designed to provide the learner with the knowledge, skills and behaviors required for entry into the clinical practice of orthotics/prosthetics. The professional curriculum commences when the student is accepted and enrolls in an NCOPE/CAAHEP-accredited orthotics/prosthetics education program.

This section includes course work that is designed to complement the specific content of the orthotic and prosthetic knowledge and skill sets taught at the program.

All learning experiences, didactic and clinical, must be accompanied by instructional objectives. These objectives must clearly outline the educational expectations in measurable outcomes while delineating the responsibilities of the learning facilitator and the student participant.

Guidelines and a comprehensive list of procedures and components that at a minimum must be included in the curriculum are outlined in Appendix D.

### **C.1.0 Foundational Content Areas**

The following content related to orthotics and prosthetics must be covered in the curriculum: (See Appendix B for additional explanation for the content areas C.1.1 through C.1.18.)

- C.1.1 Human anatomy and physiology
- C.1.2 Applied clinical skills
- C.1.3 Applied technical skills

- C.1.4 Behavioral sciences
- C.1.5 Bioethics
- C.1.6 Biomechanics
- C.1.7 CAD/CAM
- C.1.8 Clinical pathology
- C.1.9 Clinical pharmacology
- C.1.10 Communication skills
- C.1.11 Diagnostic studies
- C.1.12 Evidence-based practice
- C.1.13 Gait analysis/pathomechanics
- C.1.14 Health care economics
- C.1.15 Kinesiology
- C.1.16 Materials science
- C.1.17 Models of disability throughout the life span
- C.1.18 Neuroscience
- C.1.19 Practice management
- C.1.20 Professional issues
- C.1.21 Rehabilitation science
- C.1.22 Research methods

### **PATIENT/CLIENT MANAGEMENT**

The process of patient/client evaluation, as well as the formulation and implementation of a treatment plan and follow-up treatment plan, must be related to individual patient/client functional needs, be based on available evidence and be culturally relevant. The orthotic/prosthetic educational program must demonstrate student outcomes that show the learners' comprehension and skill in evaluation leading to the establishment of a cogent and responsive treatment plan. The overarching goal is to develop practitioners who can judiciously use evaluation data to achieve the best patient/client and orthotic/prosthetic outcomes.

### **C.2.0 PATIENT/CLIENT ASSESSMENT**

The graduate must demonstrate the ability to complete the following essentials of the patient/client evaluation process competently.

- C.2.1 Perform a comprehensive assessment of the patient/client using standardized tools and methods to obtain an understanding of the individual's potential orthotic or prosthetic needs that includes, at a minimum, specific competencies outlined in Appendix C.
- C.2.2 Determine method and criteria for referring patients/clients to other health care professionals.
- C.2.3 Document services using established record-keeping techniques to record patient/client assessment and treatment plans, to communicate fabrication requirements and to meet standards for reimbursement and regulations of external agencies.
- C.2.4 Establish a relationship and effectively communicate with the patient/client or caregiver to gather cogent and useful information for orthotic or prosthetic assessments.

### **C.3.0 FORMULATION**

The graduate must demonstrate the ability to integrate and apply foundational knowledge and patient/client information to direct potential orthotic or prosthetic management.

- C.3.1 Synthesize and integrate foundational knowledge and evidence from the literature with findings of the assessment of a patient/client.
- C.3.2. Identify impairments or functional limitations, discern patient/client goals and determine related biomechanical objectives.
- C.3.3. In collaboration with the patient/client, design an intervention plan and an appropriate orthotic or prosthetic device to meet the needs of the patient/client and the biomechanical objectives.
- C.3.4 Demonstrate, at a minimum, the ability to formulate a comprehensive plan that includes each of the specific competencies outlined in Appendix C.

### **C.4.0 IMPLEMENTATION**

The graduate must demonstrate the ability to apply the necessary skills and procedures, including fabrication, to provide orthotic or prosthetic care.

- C.4.1 Perform the necessary procedures and fabrication processes to provide prosthetic or orthotic services by using appropriate techniques, tools and equipment.
- C.4.2 Discern the possible interaction between the device and the patient/client with respect to corrective and accommodative treatment.
- C.4.3 Assess quality and structural stability of the orthosis or prosthesis based on the needs and goals of the patient/client.
- C.4.4 Evaluate the fit and function of the orthosis or prosthesis as used by the patient/client, making adjustments as necessary to obtain optimal function and meet patient/client goals.
- C.4.5 Perform transfer methods and initial gait and mobility instructions that provide for patient/client safety during appointments.
- C.4.6 Provide effective, culturally appropriate instruction to patients/clients, family members and caregivers on the care, use, maintenance, donning and doffing procedures for the orthosis or prosthesis, as well as skin care information and wearing schedules for the device.
- C.4.7 Evaluate and document the level of patient/client comprehension of these instructions.
- C.4.8 Demonstrate, at a minimum, the knowledge and skill set to implement specific procedures as outlined in Appendix C.

### **C.5.0 FOLLOW-UP**

The graduate must demonstrate the ability to develop and implement an effective follow-up plan to assure optimal fit and function of the orthosis or prosthesis.

- C.5.1 Provide continuing patient/client care and periodic evaluation to assure, maintain and document optimal fit and function of the orthosis or prosthesis.
- C.5.2 Develop an effective long-term follow-up plan for comprehensive orthotic or prosthetic care.
- C.5.3 Provide adequate education to assure the client and caregivers understand the importance of adhering to the treatment plan and regular follow-up visits.
- C.5.4 Document all interactions with the patient/client and caregivers.
- C.5.5 Demonstrate, at a minimum, specific follow-up assessment and procedures as outlined in Appendix C.

C.5.6 Assess the function and reliability of the device to pre-validated outcome measures.

### **C.6.0 PRACTICE MANAGEMENT**

The graduate must demonstrate the ability to identify and observe policies and procedures regarding human resource management, physical environment management, business and financial management and organizational management, including the following:

- C.6.1 Demonstrate knowledge of basic billing and coding procedures.
- C.6.2 Demonstrate knowledge of applicability of federal and state legislation and regulations associated with orthotic and prosthetic services.
- C.6.3 Organize documentation of clinical chart notes, legal compliance and insurance issues.
- C.6.4 Demonstrate an awareness and understanding of how orthotists and prosthetists may deal with ethical and legal responsibilities related to patient/client management.
- C.6.5 Demonstrate comprehension of the terminology specific to Medicare, with an understanding of L-coding history and usage, state regulations and third-party insurance reimbursements.

### **C.7.0 PROFESSIONAL/PERSONAL DEVELOPMENT**

The graduate must be able to demonstrate an intention to participate in personal and professional development by defining and articulating the importance of the following issues:

- C.7.1 Lifelong learning with the goal of maintaining knowledge and skills at the most current level.
- C.7.2 Engagement in community service.
- C.7.3 Engagement in service to and development of the professions.
- C.7.4 Attention to personal coping skills and potential for compassion fatigue.
- C.7.5 Exemplification of professional responsibility and ethics.
- C.7.6 Advocacy for and engagement in research to support the professions.

## **SECTION D: RESEARCH**

The graduate, as a problem solver in the clinical environment, must demonstrate the ability to perform, at an autonomous level, literature reviews as an effective component of evidence-based-practices and to participate with clinical research projects. The graduate must be able to develop viable literature searches in support of research-based activities. Each graduate is expected to complete a “capstone project/experience” as a part of the curriculum sequence.

**SECTION E: CLINICAL EXPERIENCE**

The graduate must, at a minimum, be able to articulate how the theoretical concepts learned within didactic coursework are exemplified in clinical facilities within all of the domains listed. The student also may have had opportunities to, under supervision, participate and demonstrate novice skills within any or all of these domains.

- E.1 Patient/client evaluation
- E.2 Formulation of an orthotic or prosthetic treatment plan
- E.3 Implementation of an orthotic or prosthetic treatment plan
- E.4 Follow-up assessment and continued implementation of an orthotic or prosthetic treatment plan
- E.5 Documentation of patient/client practitioner encounters for clinical decision making, communication, legal and reimbursement purposes
- E.6 Interpersonal communication among practitioners, patients/clients, caregivers and others encountered in the clinical environment
- E.7 Business management functions within the orthotic/prosthetic practice

## **Appendix A**

**NOTE:** *The 21 competencies for health professionals, as articulated by the PEW Commission, are strongly recommended for graduates of orthotic and prosthetic master's degree programs.*

The 21 PEW Commission<sup>1</sup> competencies for health profession practitioners:

1. Embrace a personal ethic of social responsibility and service.
2. Exhibit ethical behavior in all professional activities.
3. Provide evidence-based, clinically competent care.
4. Incorporate the multiple determinants of health in clinical care.
5. Apply knowledge of the new sciences.
6. Demonstrate critical thinking, reflection and problem-solving skills.
7. Understand the role of primary care.
8. Rigorously practice preventive health care.
9. Integrate population-based care and services into practice.
10. Improve access to health care for those with unmet health needs.
11. Practice relationship-centered care with individuals and families.
12. Provide culturally sensitive care to a diverse society.
13. Partner with communities in health care decisions.
14. Use communication and information technology effectively and appropriately.
15. Work in interdisciplinary teams.
16. Ensure care that balances individual, professional, system and societal needs.
17. Practice leadership.
18. Take responsibility for quality of care and health outcomes at all levels.
19. Contribute to continuous improvement of the health care system.
20. Advocate for public policy that promotes and protects the health of the public.
21. Continue to learn and help others learn.

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<sup>1</sup> Lenburg et al., 1999; O'Neil and the Pew Health Professions Commission, 1998

## **Appendix B**

**Anatomy and Physiology:** The study of the anatomical and physiological structuring of human organisms.

**Applied Clinical Skills:** Clinical evaluation skills include the student's ability to create relationships with patients/clients and use standardized assessment tools (including functional measures) in concert with the clinical examination and evidence from the literature to determine the need for orthotic or prosthetic services and design appropriate intervention strategies. These skills include, but are not limited to: assessment; review of clinically oriented literature; skilled observation; taking patient/client histories; consultations; psychomotor and social skills required to educate patients/clients, caregivers and colleagues in functionally integrating a device; safe and effective facilitation of patient transfers and initiation of mobility training; the ability to produce written documentation of clinical practice that meets legal, administrative and contractual requirements and is sufficient for use in quality improvement programs and clinical research.

**Applied Technical Skills:** The development of psychomotor skills in the application of contemporary technology, specifically to implement the treatment plan for patient/client care. The goal is to use specialized sets of technical skills to create an appropriate orthosis or prosthesis that will successfully implement the treatment plan.

**Behavioral Science:** The application of fundamental concepts in psychology to personhood, identity, personality and disability in relation to disability, health care service provision, self-care and the role of relationship building in clinical decision making. Includes the awareness of social supports and constraints and the ability to integrate them into clinical practice and outcomes.

**Bioethics:** Study involving the research and deployment of ethical, efficient and compassionate practice of the life sciences and medicine.

**Biomechanics:** The application of mechanical principles on living organisms. It includes research and analysis of the mechanics of living organisms and the application of engineering principles to and from biological systems. This includes, but is not limited to, gait and locomotion analysis via multiple measurement methods, as well as pathomechanics of joints and functional tasks, including walking.

**Computer-Aided Design/Computer-Aided Manufacturing (CAD/CAM):** The technology required to acquire and modify three-dimensional anatomical shapes digitally (CAD). This technology functions in an interface, and manufacture positive and negative molds of those shapes through computer-aided multi-axis carving (CAM).

**Clinical Pathology:** The wide spectrum of diseases that might cause an individual to need orthotic or prosthetic services. Clinical pathology will be developed based on anatomy and physiology instruction as well as instruction on pathologies such as diabetes, peripheral vascular disease, neurologic and musculoskeletal disorders, and psychological diseases.

Clinical Pharmacology: The clinical implications of current pharmacological treatment based on commonly medicated pathologies encountered in patient/client care. Practitioners must recognize the effects of medication and its impact on the clinical decision-making process. These clinical effects include physiological function (volume management, cardiac performance, pain, spasticity, dermatological effects) and cognitive function. Practitioners must also identify problematic symptoms necessitating referral to appropriate health care providers.

Communication: The ability to appropriately interact with others along the continuum of care, including the patient/client, the family, other caregivers, and members of the health care team. Interactions should be sensitive to the cultural, psycho-social, age, disability and economic stance of those with whom interaction takes place.

Diagnostic Studies: The use of information derived from instrumentation and other cogent tests and measures providing results that, when interpreted, most often lead to a diagnosis. Diagnostic studies significant for the orthotic/prosthetic practice include, but are not limited to: CAD/CAM; radiography (x-ray); computerized tomography (CT); magnetic resonance imaging (MRI); electroencephalography (EEG); ultrasonography; pedobarography (pressure mapping); instrumented gait analysis; stress/strain loading of human tissue; blood chemistries; and pulmonary function.

Evidence-Based Practice: The use of research-based evidence to justify treatment interventions. Graduates incorporating their ability as consumers of available evidence/research contribute to the establishment of best practices in orthotics and prosthetics.

Gait Analysis/Pathomechanics: The study of locomotion in humans. The technique may employ camera recording, force plates, electromyography and computer analysis to measure an individual's gait pattern objectively.

Health care Economics: The social, financial and workplace dynamics involved in an orthotics/prosthetics practice. Health care economics involves understanding how the orthotic/prosthetic profession sits in the context of the health care industry and economy as a whole and the resulting implications for an individual practitioner in clinical decision making and business management.

Kinesiology: The study of the mechanics of body movement.

Materials Science: The study of various chemical and physical properties of materials and the relationship and implications of those properties in orthotic/prosthetic design and fabrication, including the implications when human are exposed. Materials science includes, but is not limited to, concepts of stress and strain, elasticity, malleability and thermodynamics.

Models of Disability: A working knowledge of the rehabilitation process will be covered to help the student become more sensitive to the needs of the patient/client.

Neuroscience: The study of the anatomical substrate related to function of the nervous system. Topics include neuroanatomy, cellular and intercellular physiology, neuroplasticity (including motor control and motor learning), development of the nervous system and the somatic and motor systems. Neural disorders encountered in clinical practice are emphasized. Clinical correlation will provide an understanding of neurological disorders and deficits.

Practice Management: The global understanding of general business practices within the orthotic/prosthetic practice, including its role in clinical decision making, documentation, time management, compliance with regulatory agencies, reimbursement and human resources management.

Professional Issues: The understanding of the expectations of an orthotic/prosthetic practitioner as a professional, his or her role within the profession itself, and the profession's role within society. Includes, but is not limited to: exploration and understanding of orthotic and prosthetic organizations and publications; the framework outlined in ABC's *Practice Analysis of Certified Practitioners in the Disciplines of Orthotics and Prosthetics* (2007); relationships with other professionals; concepts in lifelong learning and professional development; and legal issues, including fraud, liability, patents, licensure and self-care.

Rehabilitation Science: This refers to the scope and variance of rehabilitation practices within sociocultural contexts. Includes models of disability, understanding of practice from the perspectives of all stakeholders and the implications of such on clinical decision making and clinical and functional outcomes.

Research Methods: The coursework leading to direct the learner to review research critically and use it to support evidenced-based practice. Learners should be prepared to participate in research and initiate a research project that might be used as the basis of the required capstone project. This includes, but is not limited to, understandings of the logistics and procedural supports and constraints of doing research, data management and interpretation.

**Appendix C**

This appendix is to be used as a guide to support the competencies articulated in Section C.2.0 of the document. Competencies in C.2.0 are broadly defined. The following lists of knowledge areas and general skill sets provide the student and the program with the minimal requirements of content material to be included within a given program's curriculum. Also included is a list of commonly encountered pathologies in orthotic and prosthetic practice that students should be knowledgeable about when assessing patients. This list is not all inclusive. Students should demonstrate knowledge of the pathological conditions and the potential impact on the treatment plan.

A. History

- i. Medical
- ii. Pathologies/dysfunctions
- iii. Wounds
- iv. Testing results from other disciplines
- v. Surgeries
- vi. Medications
- vii. Diagnostic imaging report(s)
- viii. Determine potential for safe use of device, including understanding instructions and level of comprehension relative to component function
- ix. Patient/client goals
- x. Personal implications of impairment
- xi. Vocational requirements
- xii. Recreational activities
- xiii. Daily functional demands
- xiv. Social interaction demands
- xv. Financial information (fiscal restraints)

B. Patient/Client Assessment

- i. Strength
- ii. Joint integrity and range
- iii. Sensory testing
- iv. Proprioceptive sense
- v. Joint stability
- vi. Volumetric measures
- vii. Pain and effect
- viii. Tone level
- ix. Neuromusculoskeletal integration
- x. Observational gait analysis
- xi. Postural evaluation
- xii. Balance evaluation
- xiii. Motor control
- xiv. Cognitive ability
- xv. Relevant psychological/emotional assessment(s)
- xvi. Skin integrity
- xvii. Functional measures

- xviii. Evaluation of current orthotic/prosthetic management
- xix. Reviewing charted evidence of vital signs, including blood pressure, pulse and respiratory rate, objective gait analysis report

C. Consult with other caregivers and other health care professionals.

D. Possess a basic understanding of surgical procedures related to orthotic and prosthetic care and how these surgical techniques impact orthotic and prosthetic design and function. The following are recommended, but not all inclusive, surgical procedures:

- i. Amputation surgery and revisions
- ii. Rotationplasty
- iii. Knee and hip replacement
- iv. Triple arthrodesis
- v. Achilles tendon lengthening
- vi. ACL repairs
- vii. Skin grafting
- viii. Bone resection for ulcer management
- ix. Rhizotomy
- x. Spinal stabilization
- xi. Internal fixation
- xii. Carpal tunnel release
- xiii. Tendon transfers

E. Consult literature to direct assessment

F. Pathologies

**Musculoskeletal disorders:**

Adhesive capsulitis (shoulder)  
Trigger thumb and fingers  
Fractures  
Rotator cuff injuries  
Mallet finger  
Bursitis  
Dislocations  
Contractures  
Ligamentous injuries  
Articular cartilage disorders  
Rheumatoid arthritis  
Osteoarthritis  
Overuse syndromes  
De Quevain's disease  
Dupuytren's contracture  
Volkman's contracture  
Osteoporosis  
Disc herniation

Spinal stenosis  
Spondylolysis, spondylolisthesis  
Vertebral osseomyelitis  
Plagiocephaly and related disorders of the cranium  
Scoliosis  
Kyphosis  
Abnormal pronation and supination  
Convex pes valgus  
Tarsal coalitions  
Talipes calcaneovalgus  
Metatarsus adductus  
Plantar fasciitis  
Posterior tibial dysfunction  
Metatarsalgia  
Morton's neuroma  
Hallux rigidus  
Hallux valgus  
Metatarsus adductus

Forefoot varus  
Rearfoot varus  
Forefoot valgus  
Plantar flexed first ray  
First ray insufficiency

**Neurologic disorders:**

Hereditary sensory motor disorders  
Spinal cord injuries  
Polio  
Muscular dystrophy  
Stroke  
Multiple sclerosis  
Peripheral neuropathies  
Peripheral nerve injuries  
Traumatic brain injuries  
Transverse myelitis

**Neuropathic disorders**

Diabetes mellitus  
Vascular disease

Buerger's disease

**Pediatric disorders**

Club foot  
Cerebral palsy  
Arthrogyrosis  
Osteogenesis imperfecta  
Spina bifida  
Developmental dysplasia of the hip  
Legg-Calve-Perthes  
Fibular deficiency  
Proximal femoral focal deficiency

**Other**

Trauma  
Postoperative complications  
Burn injuries  
Osteomyelitis  
Osteogenic sarcoma  
Tumors  
Multiple limb loss

**Appendix D**

This section is an example of one possible curriculum. Programs are encouraged to develop a curriculum, in consultation with the faculty, advisory board, educational consultants and students, that meets the standards of the profession, fulfills the program’s mission, and meets the needs of students, institutions and the citizenry.

The program must provide, at a minimum, the designated level of incorporation into the curriculum for each orthosis/prosthesis listed.

This section provides an overview of educational needs within the orthotic and prosthetic curriculum. The determined levels of educational inclusion reflect the current needs and demands of the patient population and the profession.

**Upper Limb Management**

	Knowledge of	Knowledge of assessment or supervised assessment	Knowledge of formulation of treatment plan or supervised formulation of treatment plan	Supervised assessment, formulation of treatment plan and implementation of device design, fabrication, fitting and patient education	Knowledge of follow-up plan
<b>ORTHOTICS</b>					
Finger orthoses	X	X	X		X
Thermoplastic and metal hand orthoses (HO)	X	X	X		X
Thermoplastic and metal wrist-hand orthoses (WHO)	X	X	X	X	X
Prehension orthoses	X	X	X	X	X
Additions and outriggers to HOs and WHOs	X	X	X		X
Elbow orthoses	X	X	X		X
Elbow-wrist-hand orthoses	X	X	X	X	X
Shoulder–elbow-wrist-hand orthoses, custom fit	X	X	X	X	X
Shoulder orthoses	X	X	X		X
Wrist joints	X	X	X		X
Elbow joints	X	X	X		X
Shoulder joints	X	X	X		X
Fracture orthoses	X				X
<b>PROSTHETICS</b>					
Passive hands	X	X	X		X
Mechanical hands	X	X	X		X

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	Knowledge of	Knowledge of assessment or supervised assessment	Knowledge of formulation of treatment plan or supervised formulation of treatment plan	Supervised assessment, formulation of treatment plan and implementation of device design, fabrication, fitting and patient education	Knowledge of follow-up plan
Terminal devices	X	X	X	X	X
Sports, recreation and work terminal devices	X	X	X		X
Voluntary opening	X	X	X	X	X
Voluntary closing	X	X	X		X
Terminal devices, microprocessor control feature	X	X	X		X
Wrists, constant friction	X	X	X	X	X
Wrists, quick disconnect	X	X	X		X
Rigid hinges	X	X	X		X
Polycentric hinges	X	X	X		X
Step-up hinges	X	X	X		X
Residual limb-activated hinges	X	X	X		X
Flexible hinges	X	X	X	X	X
Outside locking elbow hinges	X	X	X		X
Elbow joints, conventional	X	X	X	X	X
Shoulder joints	X	X	X		X
Lift assist	X	X	X		X
Excursion amplifier	X	X	X		X
Electric hands	X	X	X		X
Electric wrist rotator	X	X	X		X
Electric elbows	X	X	X		X
Digital control	X	X	X		X
Proportional control	X	X	X		X
Myoelectric control	X	X	X		X
Switch control	X	X	X		X
Touch pad	X	X	X		X
Linear transducer	X	X	X		X
Hybrid control	X	X	X		X
<b>Partial Hand</b>					
Passive	X	X	X		X
Body-powered, finger-driven prostheses	X	X	X		X
Body-powered, cable-driven prostheses	X	X	X		X
Task-specific prostheses	X	X	X		X
<b>Wrist Disarticulation</b>					
Passive	X	X	X		X

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	Knowledge of	Knowledge of assessment or supervised assessment	Knowledge of formulation of treatment plan or supervised formulation of treatment plan	Supervised assessment, formulation of treatment plan and implementation of device design, fabrication, fitting and patient education	Knowledge of follow-up plan
Figure 9 harness	X	X	X		X
Figure 8 harness	X	X	X		X
Shoulder saddle with chest strap harness	X	X	X		X
Medial opening	X	X	X		X
Expandable wall socket	X	X	X		X
Foam sleeve suspension in continuous socket	X	X	X		X
Frame with flexible inner liner	X	X	X		X
Gel liners	X	X	X		X
Suspension sleeves	X	X	X		X
Single control cable	X	X	X		X
<b>Transradial</b>					
Passive prostheses	X	X	X		X
Figure 9 harness	X	X	X	X	X
Figure 8 harness	X	X	X	X	X
Shoulder saddle with chest strap harness	X	X	X		X
Anatomical suspension variants	X	X	X	X	X
Frame with flexible inner liner	X	X	X		X
Locking roll-on gel liners	X	X	X		X
Suspension sleeves	X	X	X		X
Single control cable	X	X	X	X	X
<b>Elbow Disarticulation</b>					
Passive	X	X	X		X
Figure 8 harness	X	X	X		X
Shoulder saddle with chest strap harness	X	X	X		X
Medial opening	X	X	X		X
Expandable wall socket	X	X	X		X
Foam sleeve suspension in continuous socket	X	X	X		X
Frame with flexible inner liner	X	X	X		X
Gel liners	X	X	X		X
Dual-control cable	X	X	X		X
<b>Transhumeral</b>					
Passive	X	X	X		X

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Figure 8 harness	X	X	X	X	X
Shoulder saddle with chest strap harness	X	X	X		X
Frame with flexible inner liner	X	X	X		X
Locking liners	X	X	X		X
Suction	X	X	X		X
Dual-control cable	X	X	X	X	X
<b>Shoulder Disarticulation / Interscapulothoracic</b>					
Passive	X	X	X		X
Figure 8 harness	X	X	X		X
Chest strap harness	X	X	X		X
Frame with flexible inner liner	X	X	X		X
Gel liners	X	X	X		X
Dual-ontrol cable	X	X	X		X

**Lower Limb Management**

	Knowledge of	Knowledge of assessment or supervised assessment	Knowledge of formulation of treatment plan or supervised formulation of treatment plan	Supervised assessment, formulation of treatment plan and implementation of device design, fabrication, fitting and patient education	Knowledge of follow-up plan
<b>ORTHOTICS</b>					
Foot orthoses - accommodative, supportive/corrective	X	X	X	X	X
Rigid foot orthoses	X	X	X	X	X
UCBL	X	X	X	X	X
Thermoplastic ankle-foot orthoses(AFO)- solid, posterior leaf spring, articulated	X	X	X	X	X
Supramalleolar AFO	X	X	X		X
Thermoplastic knee-ankle-foot orthoses(KAFO)	X	X	X	X	X
Hip-knee-ankle-foot orthoses (HKAFO)	X	X	X		X
Metal – AFO	X	X	X	X	X
Metal – KAFO	X	X	X	X	X
Metal - HKAFO	X	X	X		X
Hybrid - AFO, KAFO, HKAFO designs	X	X	X		X
Axial resisting - AFO	X	X	X		X
Axial resisting - KAFO	X	X	X		X
CROW / neuropathic walker	X	X	X		X
Total contact cast application	X	X	X		X
Fracture orthoses	X	X	X		X
Standing frames	X	X	X		X
Reciprocating gait orthoses	X	X	X		X
Knee orthoses - compartmental unloading	X	X	X		X
Knee orthoses rehabilitative/post-operative stabilization	X	X	X		X
Knee orthoses dynamic	X	X	X		X
Pediatric hip orthoses - Scottish Rite hip orthoses, Pavlik harness	X	X	X		X
Hip orthoses	X	X	X		X

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	Knowledge of	Knowledge of assessment or supervised assessment	Knowledge of formulation of treatment plan or supervised formulation of treatment plan	Supervised assessment, formulation of treatment plan and implementation of device design, fabrication, fitting and patient education	Knowledge of follow-up plan
Knee joints - Free motion (standard, offset), locked (drop, bail, ratchet, step lock) stance lock, free swing (stance control)	X	X	X		X
Ankle joints for plastic and metal – free, limited motion, assist	X	X	X		X
Ankle, knee and hip stops, assists/resists	X	X	X	X	X
Hip joints – free, locking, reciprocating	X	X	X		X
Carlson modification	X	X	X	X	X
Varus/valgus controls-modifications	X	X	X		X
Mid/hind foot posting	X	X	X	X	X
Thermoplastic thigh cuff designs					X
<b>PROSTHETICS</b>					
SACH feet	X	X	X		X
Flexible keel feet	X	X	X		X
Dynamic response feet	X	X	X	X	X
Articulated feet	X	X	X		X
Articulated, simulated feet	X	X	X		X
Hybrid feet	X	X	X		X
Vertical shock, feature	X	X	X		X
Heel height adjustability	X	X	X		X
<b>Post-Operative Issues</b>					
Post-op volume management	X	X	X	X	X
Soft dressings	X	X	X		X
Removable and non-removable rigid dressings	X	X	X		X
Immediate postoperative prostheses	X	X	X		X
Preparatory prostheses	X	X	X		X
Diagnostic sockets	X	X	X	X	X
<b>Partial Foot</b>					
Toe filler	X	X	X		X

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Slipper prostheses	X	X	X		X
Rocker sole, rigid sole shoe modification	X	X	X		X
Solid/articulated AFO style partial foot prostheses	X	X	X		X
Silicone prostheses	X	X	X		X
Posterior opening prostheses	X	X	X		X
<b>Syme</b>					
Patellar tendon bearing	X	X	X		X
Total surface bearing	X	X	X		X
Posterior opening	X	X	X		X
Medial opening	X	X	X		X
Expandable wall socket	X	X	X		X
Foam sleeve suspension in continuous socket	X	X	X		X
<b>Transtibial</b>					
Patellar tendon bearing	X	X	X	X	X
Total surface bearing	X	X	X	X	X
Liners, gel, etc.	X	X	X	X	X
Socks	X	X	X	X	X
Suspension sleeves	X	X	X	X	X
Locking mechanisms	X	X	X	X	X
Suction with gel liner	X	X	X		X
Vacuum assist suspension	X	X	X		X
Suprapatellar cuff	X	X	X		X
Supracondylar, supracondylar-suprapatellar	X	X	X	X	X
Joint and thigh lacer	X	X	X		X
Waist belt and fork strap	X	X	X		X
<b>Knee Disarticulation</b>					
Polycentric knees	X	X	X		X
Outside knee joints	X	X	X		X
Condylar suspension (foam liner, inner sleeve, medial opening, molded socket)	X	X	X		X
<b>Transfemoral</b>					
Mechanical knees	X	X	X	X	X
Microprocessor knees	X	X	X		X
Axis - single, polycentric	X	X	X	X	X

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Cadence control - constant friction, fluid	X	X	X	X	X
Stance control – geometric lock, manual lock, fluid	X	X	X		X
Stance flexion	X	X	X		X
Quadrilateral	X	X	X		X
Ischial containment design variations	X	X	X	X	X
Flexible inner liner with rigid frame	X	X	X		X
Silesian bandage	X	X	X		X
Liners, gel, etc.	X	X	X		X
Socks	X	X	X		X
Elastic belt	X	X	X		X
Hip joint and pelvic belt	X	X	X		X
Locking mechanisms	X	X	X		X
Suction suspension	X	X	X	X	X
Suction with gel liner	X	X	X		X
Vacuum assist suspension	X	X	X		X
<b>Hip Disarticulation / Transpelvic / Translumbar</b>					
One-piece socket design	X	X	X		X
Two-piece socket design	X	X	X		X
Iliac suspension	X	X	X		X
Custom gel liner suspension	X	X	X		X

**Spinal Management**

	Knowledge of	Knowledge of assessment or supervised assessment	Knowledge of formulation of treatment plan or supervised formulation of treatment plan	Supervised assessment, formulation of treatment plan and implementation of device design, fabrication, fitting and patient education	Knowledge of follow-up plan
Custom fit cervical orthoses – soft, semi-rigid, rigid (CO)	X	X	X	X	X
Cervical-thoracic orthoses (CTO) - HALO, Minerva	X	X	X		X
Cervical-thoracic-lumbar-sacral orthoses (CTLSSO) Milwaukee	X	X	X		X
Custom fit thoracic-lumbar-sacral orthoses (TLSO) - soft/flexible, sagittal control, sagittal-coronal control	X	X	X	X	X
Custom fit thoracic-lumbar-sacral orthoses - rigid, sagittal control, sagittal-coronal control	X	X	X	X	X
Custom-fabricated thoracic–lumbar-sacral orthoses - rigid, sagittal control, sagittal-coronal control	X	X	X	X	X
TLSOs for treatment of scoliosis: low profile - custom made and custom fit, nocturnal orthoses	X	X	X		X
Custom fit lumbar-sacral orthoses – soft/flexible, sagittal control, sagittal-coronal control, posterior-coronal control	X	X	X	X	X
Custom fit lumbar-sacral orthoses - rigid, sagittal control, sagittal-coronal control, posterior-coronal control	X	X	X	X	X
Custom fabricated lumbar-sacral orthoses - rigid, sagittal control, sagittal-coronal control, posterior-coronal control	X	X			X

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Sacral orthoses	X	X	X		X
Thigh extensions	X	X	X		X
Spinal orthoses					
Rotary control techniques	X	X	X		X
Trochanteric extension	X	X	X		X
Lumbar pads for scoliosis	X	X	X		X
Thoracic pads for scoliosis	X	X	X		X

**Cranial Management**

	Knowledge of	Knowledge of assessment or supervised assessment	Knowledge of formulation of treatment plan or supervised formulation of treatment plan	Supervised assessment, formulation of treatment plan and implementation of device design, fabrication, fitting and patient education	Knowledge of follow-up plan
Cranial molding helmet	X	X	X		X