



Commission on Accreditation of Allied Health Education Programs

Standards and Guidelines for the Accreditation of Educational Programs in Orthotics and Prosthetics

Essentials/Standards initially adopted in 1993;
revised in 2001, 2006, 2010

Adopted by the
American Academy of Orthotists and Prosthetists
American Board for Certification in Orthotics, Prosthetics and Pedorthics
National Commission on Orthotic and Prosthetic Education
Commission on Accreditation of Allied Health Education Programs

The Commission on Accreditation of Allied Health Education Programs (CAAHEP) accredits programs upon the recommendation of the National Commission on Orthotic and Prosthetic Education (NCOPE).

These accreditation **Standards and Guidelines** are the minimum standards of quality used in accrediting programs that prepare individuals to enter the orthotic and prosthetic profession. Standards are the minimum requirements to which an accredited program is held accountable. Guidelines are descriptions, examples, or recommendations that elaborate on the Standards. Guidelines are not required, but can assist with interpretation of the Standards.

Standards are printed in regular typeface in outline form. *Guidelines* are printed in italic typeface in narrative form.

Preamble

The Commission on Accreditation of Allied Health Education Programs, National Commission on Orthotic and Prosthetic Education, American Academy of Orthotists and Prosthetists, and American Board for Certification in Orthotics, Prosthetics and Pedorthics cooperate to establish, maintain and promote appropriate standards of quality for educational programs in orthotics and prosthetics and to provide recognition for educational programs that meet or exceed the minimum standards outlined in these accreditation **Standards and Guidelines**. Lists of accredited programs are published for the information of students, employers, educational institutions and agencies, and the public.

These **Standards and Guidelines** are to be used for the development, evaluation, and self-analysis of orthotic and prosthetic programs. On-site review teams assist in the evaluation of a program's relative compliance with the accreditation Standards.

Description of the Profession

Orthotics and prosthetics is a specialized health care profession, which combines a unique blend of clinical and technical skills to care for patients who have neuromuscular and musculoskeletal disorders and/or patients who have a partial or total absence of a limb. Orthotists and prosthetists provide treatment that allows these individuals to lead more active and independent lives by collaborating with other members of the healthcare team. This work requires substantial clinical and technical judgment.

The principles of biomechanics, pathomechanics, gait analysis, kinesiology, anatomy and physiology are crucial to the practitioner's ability to provide comprehensive patient care and a positive clinical outcome. Patient assessment, treatment and education are part of the practitioner's responsibility and require collaborative communication skills.

In addition to performing orthotic and prosthetic procedures, the orthotist and prosthetist are involved in clinical decision-making and patient education. The scope of practice for orthotist and prosthetist includes, but is not limited to:

- Patient Assessment – Perform a comprehensive assessment of the patient to obtain an understanding of the patient's orthotic/prosthetic needs
- Formulation of the treatment plan – Create a comprehensive orthotic/prosthetic treatment plan to meet the needs and goals of the patient
- Implementation of the treatment plan – Perform the necessary procedures to deliver the appropriate orthotic/prosthetic services, which may include fabrication of the orthosis/prosthesis
- Follow-up treatment plan – Provide continuing patient care and periodic evaluation to assure/maintain/document optimal fit and function of the orthosis/prosthesis
- Practice management – Develop, implement and/or monitor policies and procedures regarding human resource management, physical environment management, business/financial management and organizational management
- Promotion of competency and enhancement of professional practice – Participate in personal and professional development through continuing education, training, research and organizational affiliations.

I. Sponsorship

A. Sponsoring Educational Institution

A sponsoring institution must be a post-secondary academic institution accredited by an institutional accrediting agency that is recognized by the U.S. Department of Education, and must be authorized under applicable law or other acceptable authority to provide a post-secondary program, which awards a minimum of a masters degree_at the completion of the program.

B. Consortium Sponsor

1. A consortium sponsor is an entity consisting of two or more members that exists for the purpose of operating an educational program. In such instances, at least one of the members of the consortium must meet the requirements of a sponsoring educational institution as described in I.A.
2. The responsibilities of each member of the consortium must be clearly documented in a formal affiliation agreement or memorandum of understanding, which includes governance and lines of authority.

C. Responsibilities of Sponsor

The Sponsor must ensure that the provisions of these **Standards and Guidelines** are met.

II. Program Goals

A. Program Goals and Outcomes

There must be a written statement of the program's goals and learning domains consistent with and responsive to the demonstrated needs and expectations of the various communities of interest served by the educational program. The communities of interest that are served by the program must include, but are not limited to, students, graduates, faculty, sponsor administration, employers, physicians, and the public.

Program-specific statements of goals and learning domains provide the basis for program planning, implementation, and evaluation. Such goals and learning domains must be compatible with the mission of the sponsoring institution(s), the expectations of the communities of interest, and nationally accepted

standards of roles and functions. Goals and learning domains are based upon the substantiated needs of health care providers and employers, and the educational needs of the students served by the educational program.

B. Appropriateness of Goals and Learning Domains

The program must regularly assess its goals and learning domains. Program personnel must identify and respond to changes in the needs and/or expectations of its communities of interest.

An advisory committee, which is representative of at least each of the communities of interest named in these **Standards**, must be designated and charged with the responsibility of meeting at least annually, to assist program and sponsor personnel in formulating and periodically revising appropriate goals and learning domains, monitoring needs and expectations, and ensuring program responsiveness to change.

The meeting of the advisory committee does not necessarily have to be a face to face meeting. Meetings held by way of conference call or electronic means are acceptable. Minutes from the meeting will need to be maintained and will be reviewed during site visits.

C. Minimum Expectations

The program must have the following goal defining minimum expectations: "To prepare competent entry-level orthotists and prosthetists in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains."

Programs adopting educational goals beyond entry-level competence must clearly delineate this intent and provide evidence that all students have achieved the basic competencies prior to entry into the field.

Nothing in this Standard restricts programs from formulating goals beyond entry-level competence.

III. Resources

A. Type and Amount

Program resources must be sufficient to ensure the achievement of the program's goals and outcomes. Resources must include, but are not limited to: faculty; clerical and support staff; curriculum; finances; offices; classroom, laboratory, and, ancillary student facilities; clinical affiliates; equipment; supplies; computer resources; instructional reference materials, and faculty/staff continuing education.

B. Personnel

The sponsor must appoint sufficient faculty and staff with the necessary qualifications to perform the functions identified in documented job descriptions and to achieve the program's stated goals and outcomes.

1. Program Director

a. Responsibilities

The Program Director must be responsible for all aspects of the program, including the organization, administration, continuous review, planning, development, and general effectiveness of the program.

b. Qualifications

The Program Director must:

- (1) Possess a minimum of a masters degree;
- (2) Be credentialed in the profession of Orthotics & Prosthetics through a certification program accredited by the National Commission for Certifying Agencies (NCCA) or hold a professional license as is required by the state in which he/she is employed;
- (3) Have a minimum of five years of teaching, clinical and administrative experience in a profession related to orthotics and prosthetics.

The Program Director should pursue ongoing formal training designed to maintain and upgrade his/her professional, instructional and administrative capabilities.

2. Faculty and/or Instructional Staff

a. Responsibilities

In classrooms, laboratories, and each location where students are assigned for didactic or clinical instruction or supervised practice, there must be (a) qualified individual(s) designated to provide instruction, supervision, and timely assessments of the students' progress in achieving program requirements.

b. Qualifications

Faculty and/or Instructional Staff must:

- (1) Possess a minimum of a baccalaureate degree;
- (2) Be appropriately credentialed or licensed for the content/subject area being taught through professional preparation and experience in their respective academic areas.

The program faculty should include physicians, physical and occupational therapists, and specialists in the psychosocial areas.

C. Curriculum

The curriculum must ensure the achievement of program goals and learning domains. Instruction must be an appropriate sequence of classroom, laboratory, and clinical activities. Instruction must be based on clearly written course syllabi that include course description, course objectives, methods of evaluation, topic outline, and competencies required for graduation.

The program must demonstrate that the curriculum meets or exceeds the content of the latest edition of the *Core Curriculum for Orthotists and Prosthetists*. (Appendix B)

To accomplish the requisite integration of knowledge, theory and application of the clinical and technical aspects of the disciplines, a variety of instructional methods should be employed, including instructor presentations and demonstrations, interactive experiences, internet-based assignments, self-directed activities, structured laboratory experiences and supervised clinical experiences.

The program should consist of a minimum 60 semester credits or the equivalent.

D. Resource Assessment

The program must, at least annually, assess the appropriateness and effectiveness of the resources described in these **Standards**. The results of resource assessment must be the basis for ongoing planning and appropriate change. An action plan must be developed when deficiencies are identified in the program resources. Implementation of the action plan must be documented and results measured by ongoing resource assessment.

IV. Student and Graduate Evaluation/Assessment

A. Student Evaluation

1. Frequency and purpose

Evaluation of students must be conducted on a recurrent basis and with sufficient frequency to provide both the students and program faculty with valid and timely indications of the students' progress toward and achievement of the competencies and learning domains stated in the curriculum.

2. Documentation

Records of student evaluations must be maintained in sufficient detail to document learning progress and achievements.

B. Outcomes

1. Outcomes Assessment

The program must periodically assess its effectiveness in achieving its stated goals and learning domains. The results of this evaluation must be reflected in the review and timely revision of the program.

Outcomes assessments must include, but are not limited to: NCCA accredited national credentialing examination(s) performance, programmatic retention/attrition, graduate satisfaction, employer satisfaction, job (positive) placement, and programmatic summative measures. The program must meet the outcomes assessment thresholds.

“Positive placement” means that the graduate is employed full or part-time in a related field; and/or continuing his/her education; and/ or serving in the military.

2. Outcomes Reporting

The program must periodically submit to the NCOPE the program goal(s), learning domains, evaluation systems (including type, cut score, and appropriateness), outcomes, its analysis of the outcomes, and an appropriate action plan based on the analysis.

Programs not meeting the established thresholds must begin a dialogue with the NCOPE to develop an appropriate plan of action to respond to the identified shortcomings.

V. Fair Practices

A. Publications and Disclosure

1. Announcements, catalogs, publications, and advertising must accurately reflect the program offered.
2. At least the following must be made known to all applicants and students: the sponsor’s institutional and programmatic accreditation status as well as the name, mailing address, web site address, and phone number of the accrediting agencies; admissions policies and practices, including technical standards (when used); policies on advanced placement, transfer of credits, and credits for experiential learning; number of credits required for completion of the program; tuition/fees and other costs required to complete the program; policies and processes for withdrawal and for refunds of tuition/fees.
3. At least the following must be made known to all students: academic calendar, student grievance procedure, criteria for successful completion of each segment of the curriculum and for graduation, and policies and processes by which students may perform clinical work while enrolled in the program.
4. The sponsor must maintain, and provide upon request, current and consistent information about student/graduate achievement that includes the results of one or more of the outcomes assessments required in these **Standards**.

The sponsor should develop a suitable means of communicating to the communities of interest the achievement of students/graduates.

B. Lawful and Non-discriminatory Practices

All activities associated with the program, including student and faculty recruitment, student admission, and faculty employment practices, must be non-discriminatory and in accord with federal and state statutes, rules, and regulations. There must be a faculty grievance procedure made known to all paid faculty.

C. Safeguards

The health and safety of patients, students, and faculty associated with the educational activities of the students must be adequately safeguarded.

All activities required in the program must be educational and students must not be substituted for staff.

D. Student Records

Satisfactory records must be maintained for student admission, advisement, counseling, and evaluation. Grades and credits for courses must be recorded on the student transcript and permanently maintained by the sponsor in a safe and accessible location.

E. Substantive Change

The sponsor must report substantive change(s) as described in Appendix A to CAAHEP/NCOPE in a timely manner. Additional substantive changes to be reported to NCOPE within the time limits prescribed include:

1. Change/addition/deletion of courses that represent significant departure in curriculum content;
2. Change in method of curriculum delivery;
3. Change in degree awarded;
4. Substantial increase/decrease in clock or credit hours for successful completion of a program

F. Agreements

There must be a formal affiliation agreement or memorandum of understanding between the sponsor and all other entities that participate in the education of the students describing the relationship, roles, and responsibilities of the sponsor and that entity.

APPENDIX A

Application, Maintenance and Administration of Accreditation

A. Program and Sponsor Responsibilities

1. Applying for Initial Accreditation

- a. The chief executive officer or an officially designated representative of the sponsor completes a "Request for Accreditation Services" form and returns it to:

NCOPE
330 John Carlyle St., Suite 200
Alexandria, VA 22314

The "Request for Accreditation Services" form can be obtained from the National Commission on Orthotic and Prosthetic Education (NCOPE), CAAHEP, or the CAAHEP website at www.caahep.org.

Note: There is **no** CAAHEP fee when applying for accreditation services; however, individual committees on accreditation may have an application fee.

- b. The program undergoes a comprehensive review, which includes a written self-study report and an on-site review.

The self-study instructions and report form are available from the NCOPE. The on-site review will be scheduled in cooperation with the program and NCOPE once the self-study report has been completed, submitted, and accepted by the NCOPE.

2. Applying for Continuing Accreditation

- a. Upon written notice from the NCOPE, the chief executive officer or an officially designated representative of the sponsor completes a "Request for Accreditation Services" form, and returns it to:

NCOPE
330 John Carlyle St., Suite 200
Alexandria, VA 22314.

- b. The program may undergo a comprehensive review in accordance with the policies and procedures of the NCOPE.

If it is determined that there were significant concerns with the on-site review, the sponsor may request a second site visit with a different team.

After the on-site review team submits a report of its findings, the sponsor is provided the opportunity to comment in writing and to correct factual errors prior to the NCOPE forwarding a recommendation to CAAHEP.

3. Administrative Requirements for Maintaining Accreditation

- a. The program must inform the NCOPE and CAAHEP within a reasonable period of time (as defined by NCOPE and CAAHEP policies) of changes in chief executive officer, dean of health professions or equivalent position, and required program personnel.
- b. The sponsor must inform CAAHEP and the NCOPE of its intent to transfer program sponsorship. To begin the process for a Transfer of Sponsorship, the current sponsor must submit a letter (signed by the CEO or designated individual) to CAAHEP and the NCOPE that it is relinquishing its sponsorship of the program. Additionally, the new sponsor must submit a "Request for Transfer of Sponsorship Services" form. The NCOPE has the discretion of requesting a new self-study report with or without an on-site review. Applying for a transfer of sponsorship does not guarantee that the transfer of accreditation will be granted.

- c. The sponsor must promptly inform CAAHEP and the NCOPE of any adverse decision affecting its accreditation by recognized institutional accrediting agencies and/or state agencies (or their equivalent).
- d. Comprehensive reviews are scheduled by the NCOPE in accordance with its policies and procedures. The time between comprehensive reviews is determined by the NCOPE and based on the program's on-going compliance with the Standards, however, all programs must undergo a comprehensive review at least once every ten years.
- e. The program and the sponsor must pay NCOPE and CAAHEP fees within a reasonable period of time, as determined by the NCOPE and CAAHEP respectively.
- f. The sponsor must file all reports in a timely manner (self-study report, progress reports, annual reports, etc.) in accordance with NCOPE policy.
- g. The sponsor must agree to a reasonable on-site review date that provides sufficient time for CAAHEP to act on a NCOPE accreditation recommendation prior to the "next comprehensive review" period, which was designated by CAAHEP at the time of its last accreditation action, or a reasonable date otherwise designated by the NCOPE.

Failure to meet any of the aforementioned administrative requirements may lead to administrative probation and ultimately to the withdrawal of accreditation. CAAHEP will immediately rescind administrative probation once all administrative deficiencies have been rectified.

4. Voluntary Withdrawal of a CAAHEP- Accredited Program

Voluntary withdrawal of accreditation from CAAHEP may be requested at any time by the Chief Executive Officer or an officially designated representative of the sponsor writing to CAAHEP indicating: the last date of student enrollment, the desired effective date of the voluntary withdrawal, and the location where all records will be kept for students who have completed the program.

5. Requesting Inactive Status of a CAAHEP- Accredited Program

Inactive status may be requested from CAAHEP at any time by the Chief Executive Officer or an officially designated representative of the sponsor writing to CAAHEP indicating the desired date to become inactive. No students can be enrolled or matriculated in the program at any time during the time period in which the program is on inactive status. The maximum period for inactive status is two years. The sponsor must continue to pay all required fees to the NCOPE and CAAHEP to maintain its accreditation status.

To reactivate the program the Chief Executive Officer or an officially designated representative of the sponsor must notify CAAHEP of its intent to do so in writing to both CAAHEP and the NCOPE. The sponsor will be notified by the NCOPE of additional requirements, if any, that must be met to restore active status.

If the sponsor has not notified CAAHEP of its intent to re-activate a program by the end of the two-year period, CAAHEP will consider this a "Voluntary Withdrawal of Accreditation."

B. CAAHEP and Committee on Accreditation Responsibilities – Accreditation Recommendation Process

- 1. After a program has had the opportunity to comment in writing and to correct factual errors on the on-site review report, the NCOPE forwards a status of public recognition recommendation to the CAAHEP Board of Directors. The recommendation may be for any of the following statuses: initial accreditation, continuing accreditation, transfer of sponsorship, probationary accreditation, withhold accreditation, or withdraw accreditation.

The decision of the CAAHEP Board of Directors is provided in writing to the sponsor immediately following the CAAHEP meeting at which the program was reviewed and voted upon.

2. Before the NCOPE forwards a recommendation to CAAHEP that a program be placed on probationary accreditation, the sponsor must have the opportunity to request reconsideration of that recommendation or to request voluntary withdrawal of accreditation. The NCOPE's reconsideration of a recommendation for probationary accreditation must be based on conditions existing both when the committee arrived at its recommendation as well as on subsequent documented evidence of corrected deficiencies provided by the sponsor.

The CAAHEP Board of Directors' decision to confer probationary accreditation is not subject to appeal.

3. Before the NCOPE forwards a recommendation to CAAHEP that a program's accreditation be withdrawn or that accreditation be withheld, the sponsor must have the opportunity to request reconsideration of the recommendation, or to request voluntary withdrawal of accreditation or withdrawal of the accreditation application, whichever is applicable. The NCOPE's reconsideration of a recommendation of withdraw or withhold accreditation must be based on conditions existing both when the NCOPE arrived at its recommendation as well as on subsequent documented evidence of corrected deficiencies provided by the sponsor.

The CAAHEP Board of Directors' decision to withdraw or withhold accreditation may be appealed. A copy of the CAAHEP "Appeal of Adverse Accreditation Actions" is enclosed with the CAAHEP letter notifying the sponsor of either of these actions.

At the completion of due process, when accreditation is withheld or withdrawn, the sponsor's Chief Executive Officer is provided with a statement of each deficiency. Programs are eligible to re-apply for accreditation once the sponsor believes that the program is in compliance with the accreditation *Standards*.

Any student who completes a program that was accredited by CAAHEP at any time during his/her matriculation is deemed by CAAHEP to be a graduate of a CAAHEP-accredited program.

APPENDIX B

Core Curriculum for Orthotists and Prosthetists

Section A ENTRY-LEVEL COMPETENCIES

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

- A.2.1 Exemplify the role of the orthotist/prosthetist in providing ethical patient-centered care by applying nationally accepted 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 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-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 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 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 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.

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 Commission¹ competencies for health profession practitioners:

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

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*

Section B GENERAL CONTENT AREAS

The basic science curriculum must include appropriate content in:

- B.1.1 Life Sciences/Biology with lab
- B.1.2 Chemistry with lab
- B.1.3 Physics with lab
- B.1.4 Human Anatomy and Physiology
- B.1.5 Human Growth & Development or Abnormal Psychology
- B.1.6 Statistics

In addition, the following topics are recommended, but not required:

- Business Management*
- Ethics*
- Human Anatomy and Physiology Lab*

Each sponsoring educational institution should determine whether the General Content Areas are incorporated into the professional curriculum or required prior to entry into the program.

Section C PROFESSIONAL CURRICULUM

C.1.0 Foundational Content Areas

The following content areas related to orthotics and prosthetics must be covered in the curriculum: (Additional explanation for content areas is below.)

- C.1.1 Advanced clinical and applied technology
- 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 Clinical pathology
- C.1.8 Clinical pharmacology
- C.1.9 Communication skills
- C.1.10 Diagnostic studies
- C.1.11 Evidence-based practice
- C.1.12 Gait analysis/pathomechanics
- C.1.13 Health care economics
- C.1.14 Human anatomy and physiology
- C.1.15 Kinesiology
- C.1.16 Materials science
- C.1.17 Models of disablement

C.1.18 Neuroscience
C.1.19 Practice management
C.1.20 Professional issues

C.1.21 Rehabilitation science
C.1.22 Research methods

Definitions for foundational content areas:

Advanced Clinical and Applied Technology: Integration of non-traditional techniques in the measurement, fabrication, and devices delivered in contemporary O&P practice. This includes knowledge of computer aided design, electrical circuitry, and biomechanical and biomedical engineering concepts.

Applied Clinical Skills: Clinical evaluation skills include the students' ability to create relationships with patients and appropriately use standardized assessment tools (including functional measures) in concert with the clinical examination, as well as evidence from the literature, to determine the need for orthotic-prosthetic services and design appropriate intervention strategies. These skills include, but are not limited to: assessments, clinically oriented literature review, skilled observations, histories, consultations, interviews; psychomotor and social skills required to educate patients, caregivers and colleagues in functionally integrating a device and safely and effectively facilitate movement and initiate mobility training; the ability to produce written documentation of clinical practice, including decision-making in a clear, concise, complete and timely manner 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 appropriate patient care. The goal is to use specialized sets of technical skills in the assessment, measurement and fabrication processes to create an appropriate orthosis/prosthesis that will successfully implement the treatment plan.

Behavioral Science: The application of fundamental concepts in psychology to personality and disability in relation to health care service provision, self-care and the role of relationship building in clinical decision making. This includes the awareness of social supports and constraints and the ability to integrate them into clinical practice and outcomes. Also includes an understanding of strategies for dealing with patients in distress, motivational techniques, and the ability to identify problematic psychological symptoms necessitating referral to appropriate health care providers.

Bioethics: Study involving the research of and deployment in the 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).

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

Clinical Pharmacology: Clinical implications of current pharmacological treatment based on commonly medicated pathologies encountered in patient care. Recognizing 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) and cognitive function. This includes the ability to identify problematic signs and symptoms necessitating referral to appropriate healthcare providers.

Communication: Developing the ability to effectively share with and appropriately interact with others along the continuum of care; including the patient, the family and other caregivers, members of the healthcare team and others involved with achieving the expected intervention/treatment outcomes. Interactions should be sensitive to the cultural, psycho-social, age, disability and economic stance of the person(s) with whom the interaction takes place.

Diagnostic Studies: 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 orthotic-prosthetic practice include, but are not limited to, radiography (x-ray), computerized tomography (CT), and magnetic resonance imaging (MRI), electromyography (EMG), electroencephalography (EEG), ultrasonography, pedobarography (pressure mapping), instrumented gait analysis, stress/strain loading of human tissue, blood chemistries and pulmonary function.

Evidence-Based Practice: Use of research-based evidence as justification of orthotic/prosthetic treatment interventions.

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

Healthcare Economics: The social, financial and workplace dynamics involved in orthotic and prosthetic practice. Understandings of how the orthotic-prosthetic profession and industry sit in the context of the healthcare industry and economy as a whole and the implications for an individual practitioner in clinical decision making and business management.

Human Anatomy and Physiology: Study of the anatomical and physiological structuring of organisms.

Kinesiology: The study of the mechanics of body movement.

Materials Science: Study of various chemical and physical properties of materials and the relationship and implications of those properties in orthotic-prosthetic design and fabrication. Also, includes the implications of these properties when human are exposed. Includes, but not limited to concepts of stress/strain, elasticity, malleability, thermodynamics.

Models of Disablement: An understanding of the rehabilitation process in order to become more sensitive to the needs of the patient.

Neuroscience: 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: Global understanding of general business practices within orthotic-prosthetic practice, including its role in clinical decision making, documentation, time management and compliance with regulatory agencies, reimbursement and human resource management.

Professional Issues: Understanding of the expectations of an orthotist-prosthetist as a professional and his/her role within the profession itself and the profession within society. Includes, but not limited to, exploration and understanding of orthotic-prosthetic organizations and related statements and publications, the framework outlined in the Practice Analysis, relationships with other professionals,

concepts in lifelong learning and professional development, legal issues (fraud, liability, patent, licensure) and self care.

Rehabilitation Science: 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: Coursework to support and direct the student to be able to critically review and utilize research to support evidenced based practice, 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 research, data management and interpretation.

C.2.0 Patient Assessment

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

- C.2.1 Perform a comprehensive assessment of the patient using standardized tools and methods to obtain an understanding of the individual's potential orthotic/prosthetic needs that includes the specific competencies in C.2.5
- C.2.2 Determine method and criteria for referring patients to other health care professionals.
- C.2.3 Document services using established record-keeping techniques to record patient 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 or caregiver to gather cogent and useful information for orthotic and/or prosthetic assessments.
- C.2.5 Specific competencies for patient assessment:

Students must be knowledgeable in commonly encountered pathologies when assessing patients and the potential impact on the treatment plan, including but not limited to:

A. Patient 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 "gadget tolerance".
- ix. Patient goals
- x. Personal implications of impairment
- xi. Vocation
- xii. Recreational activities
- xiii. Daily functional demands
- xiv. Social
- xv. Financial information

B. Patient Assessment

- i. Strength
- ii. Joint integrity and range of motion
- iii. Sensory testing
- iv. Proprioceptive sense
- v. Joint stability
- vi. Volumetric measures
- vii. Pain and effect/affect
- viii. Tone
- 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

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 revision*
- ii. Rotationplasty*
- iii. Joint replacement*
- iv. Tendon lengthening*
- v. Ligament repairs/reconstruction*
- vi. Skin grafting*
- vii. Bone resection for ulcer management*
- viii. Rhizotomy*
- ix. Spinal stabilization*
- x. Internal fixation*
- xi. Nerve release*
- xii. Joint fusion*

E. Pathologies

Musculoskeletal disorders

abnormal pronation and supination
adhesive capsulitis (shoulder)
articular cartilage disorders
bursitis
contractures
convex pes valgus
De Quevain's disease

disc herniation
dislocations
Dupuytren's contracture
first ray insufficiency
first ray insufficiency
forefoot valgus
forefoot varus
fractures
hallux rigidus

hallux valgus
 kyphosis
 ligamentous injuries
 mallet finger
 metatarsalgia
 metatarsus adductus
 metatarsus abductus
 Morton's neuroma
 osteoarthritis
 osteoporosis
 plagiocephaly and related cranial disorders
 plantar fasciitis
 plantar flexed first ray
 posterior tibial dysfunction
 rearfoot varus
 repetitive stress injuries
 rheumatoid arthritis
 rotator cuff injuries
 scoliosis
 spinal stenosis
 spondylolysis
 spondylolisthesis
 talipes calcaneovalgus
 tarsal coalitions
 trigger thumb and fingers
 vertebral osteomyelitis
 Volkmann's contracture

Neurologic disorders

cerebral vascular accident
 Gullain Barre
 hereditary motor and sensory disorders
 multiple sclerosis
 peripheral nerve injuries
 peripheral neuropathies

poliomyelitis
 spinal cord injuries
 transverse myelitis
 traumatic brain injuries

Neuropathic disorders

Buerger's disease
 diabetes mellitus
 vascular disease

Pediatric disorders

arthrogyposis multiplex cogenita
 cerebral palsy
 developmental dysplasia of the hip
 fibular deficiency
 Legg-Calve-Perthes
 osteogenesis imperfecta
 proximal femoral focal deficiency
 spina bifida
 spinal muscular atrophy
 talipes equinovarus

Other

burn injuries
 cancers
 complex regional pain syndrome
 multiple limb loss
 muscular dystrophies
 osteogenic sarcoma
 osteomyelitis
 post-operative complications
 spasticity
 trauma
 tumors

C.3.0 Formulation

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

C.3.1 Synthesize and integrate foundational knowledge and evidence from literature with findings of the assessment of a patient.

C.3.2. Identify impairments or functional limitations, discern patient goals and determine related biomechanical objectives.

C.3.3. In collaboration with the patient, design an intervention plan and an appropriate orthotic and/or prosthetic device to meet the needs of the patient and the biomechanical objectives.

C.3.4 Demonstrate the ability to formulate a comprehensive treatment plan.

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 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.
- C.4.4 Evaluate the fit and function of the orthosis or prosthesis as used by the patient, making adjustments as necessary to obtain optimal function and meet patient goals.
- C.4.5 Perform transfer methods and initial gait and mobility instructions that provide for patient safety during appointments.
- C.4.6 Provide effective, culturally appropriate instruction to patients, family members and caregivers on the care, use and maintenance of 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 comprehension of these instructions.

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 and monitor the outcome of the treatment plan.

- C.5.1 Provide continuing patient 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 patient 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 and caregivers.
- C.5.5 Demonstrate follow-up assessment regarding fit and function of the device.
- C.5.6 Assess the function and reliability of the device using scientifically-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, 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 Demonstrate the ability to document clinical chart notes, legal compliance and insurance issues.
- C.6.4 Demonstrate an understanding of how orthotists and prosthetists may deal with ethical and legal responsibilities related to patient management.
- C.6.5 Demonstrate knowledge 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 articulate the importance of personal and professional development including the following areas:

- 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 profession.
- 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.
- C.7.7 Knowledge of O & P in the international community.

C.8.0 Orthoses/Prostheses

This section provides a comprehensive list of procedures that must be covered in the curriculum. The program must provide, at a minimum, the designated level of incorporation into the curriculum for each device/component listed. The determined levels of educational inclusion reflect the current demands of the patient population and the profession.

Upper Limb Orthoses

1. **Knowledge of:**
2. **Knowledge of assessment or supervised assessment:**
3. **Knowledge of formulation of treatment plan or supervised formulation of treatment plan:**
4. **Knowledge of follow-up plan:**

- Finger orthoses
- Thermoplastic and metal hand orthoses (HO)
- Thermoplastic and metal wrist-hand orthoses (WHO)
- Prehension orthoses
- Additions and outriggers to HOs and WHOs
- Elbow orthoses
- Elbow-wrist-hand orthoses
- Shoulder–elbow-wrist-hand orthoses, custom fit
- Shoulder orthoses
- Wrist joints
- Elbow joints
- Shoulder joints
- Fracture orthoses

5. **Supervised assessment, formulation of treatment plan and implementation of device design, fabrication, fitting and patient education:**

- Thermoplastic and metal wrist-hand orthoses (WHO)
- Prehension orthoses
- Shoulder–elbow-wrist-hand orthoses, custom fit

Upper Limb Prostheses

1. **Knowledge of:**
2. **Knowledge of assessment or supervised assessment:**
3. **Knowledge of formulation of treatment plan or supervised formulation of treatment plan:**
4. **Knowledge of follow-up plan:**

- Passive hands
- Mechanical hands
- Terminal devices
- Sports, recreation and work terminal devices
- Voluntary opening
- Voluntary closing
- Terminal devices, microprocessor control feature
- Wrists, constant friction
- Wrists, quick disconnect
- Rigid hinges
- Polycentric hinges
- Step-up hinges
- Residual limb-activated hinges
- Flexible hinges
- Outside locking elbow hinges
- Elbow joints, conventional
- Shoulder joints
- Lift assist
- Excursion amplifier
- Electric hands
- Electric wrist rotator
- Electric elbows
- Digital control
- Proportional control
- Myoelectric control
- Switch control
- Touch pad
- Linear transducer
- Hybrid control

Partial Hand

- Passive
- Body-powered, finger-driven prostheses
- Body-powered, cable-driven prostheses
- Task-specific prostheses

Wrist Disarticulation

- Passive
- Figure 9 harness
- Figure 8 harness
- Shoulder saddle with chest strap harness
- Medial opening
- Expandable wall socket
- Foam sleeve suspension in continuous socket
- Frame with flexible inner liner
- Gel liners
- Suspension sleeves
- Single control cable

Transradial

- Passive prostheses
- Figure 9 harness
- Figure 8 harness
- Shoulder saddle with chest strap harness
- Anatomical suspension variants
- Frame with flexible inner liner
- Locking roll-on gel liners
- Suspension sleeves
- Single control cable

Elbow Disarticulation

- Passive
- Figure 8 harness
- Shoulder saddle with chest strap harness
- Medial opening
- Expandable wall socket
- Foam sleeve suspension in continuous socket
- Frame with flexible inner liner
- Gel liners
- Dual-control cable

Transhumeral

- Passive
- Figure 8 harness
- Shoulder saddle with chest strap harness
- Frame with flexible inner liner
- Locking liners
- Suction
- Dual-control cable

Shoulder Disarticulation/Interscapulothoracic

- Passive
- Figure 8 harness
- Chest strap harness
- Frame with flexible inner liner
- Gel liners
- Dual-control cable

5. Supervised assessment, formulation of treatment plan and implementation of device design, fabrication, fitting and patient education:

- Terminal devices
- Voluntary opening
- Wrists, constant friction
- Flexible hinges
- Elbow joints, conventional

Transradial

- Figure 9 harness
- Figure 8 harness
- Anatomical suspension variants
- Single control cable

Transhumeral

- Figure 8 harness
- Dual-control cable

Lower Limb Orthoses

1. Knowledge of:
2. Knowledge of assessment or supervised assessment:
3. Knowledge of formulation of treatment plan or supervised formulation of treatment plan:
4. Knowledge of follow-up plan:

- Foot orthoses - accommodative, supportive/corrective
- Rigid foot orthoses
- UCBL
- Thermoplastic ankle-foot orthoses (AFO) - solid, posterior leaf spring, articulated
- Supramalleolar AFO
- Thermoplastic knee-ankle-foot orthoses (KAFO)
- Hip-knee-ankle-foot orthoses (HKAFO)
- Metal – AFO
- Metal – KAFO
- Metal - HKAFO
- Hybrid - AFO, KAFO, HKAFO designs
- Floor reaction AFO
- Axial resist AFO
- Axial resist KAFO
- CROW / neuropathic walker
- Total contact cast application
- Fracture orthoses
- Standing frames
- Reciprocating gait orthoses
- Knee orthoses - compartmental unloading
- Knee orthoses -rehabilitative/post-operative stabilization
- Knee orthoses - dynamic
- Pediatric hip orthoses - Scottish Rite hip orthoses, Pavlik harness
- Hip orthoses
- Knee joints - Free motion (standard, offset), locked (drop, bail, ratchet, step lock) stance lock, free swing (stance control)
- Ankle joints for plastic and metal – free, limited motion, assist
- Ankle, knee and hip stops, assists/resists
- Hip joints – free, locking, reciprocating
- Carlson modification
- Varus/valgus controls- modifications
- Mid/hind foot posting
- Thermoplastic thigh cuff designs

5. Supervised assessment, formulation of treatment plan and implementation of device design, fabrication, fitting and patient education:

- Foot orthoses - accommodative, supportive/corrective
- Rigid foot orthoses
- UCBL
- Thermoplastic ankle-foot orthoses (AFO) - solid, posterior leaf spring, articulated
- Thermoplastic knee-ankle-foot orthoses (KAFO)
- Metal – AFO
- Metal – KAFO
- Ankle, knee and hip stops, assists/resists
- Carlson modification
- Mid/hind foot posting

Lower Limb Prostheses

1. Knowledge of:
2. Knowledge of assessment or supervised assessment:
3. Knowledge of formulation of treatment plan or supervised formulation of treatment plan:
4. Knowledge of follow-up plan:

- SACH feet
- Flexible keel feet
- Dynamic response feet
- Articulated feet
- Articulated, simulated feet
- Hybrid feet

- Vertical shock, feature

- Heel height adjustability

Post-Operative Issues

- Post-op volume management
- Soft dressings
- Removable and non-removable rigid dressings

- Immediate postoperative prostheses
- Preparatory prostheses
- Diagnostic sockets

Partial Foot

- Toe filler
- Slipper prostheses
- Rocker sole, rigid sole shoe modification

- Solid/articulated AFO style partial foot prostheses
- Silicone prostheses
- Posterior opening prostheses

Symes

- Patellar tendon bearing
- Total surface bearing
- Posterior opening
- Medial opening

- Expandable wall socket
- Foam sleeve suspension in continuous socket

Transtibial

- Patellar tendon bearing
- Total surface bearing
- Liners, gel, etc.
- Socks
- Suspension sleeves
- Locking mechanisms
- Suction with gel liner

- Vacuum assist suspension
- Suprapatellar cuff
- Supracondylar, supracondylar-suprapatellar
- Joint and thigh lacer
- Waist belt and fork strap

Knee Disarticulation

- Polycentric knees
- Outside knee joints
- Condylar suspension (foam liner, inner sleeve, medial opening, molded socket)

Transfemoral

- Mechanical knees
- Microprocessor knees
- Axis - single, polycentric
- Cadence control - constant friction, fluid
- Stance control – geometric lock, manual lock, fluid
- Stance flexion
- Quadrilateral
- Ischial containment design variations
- Flexible inner liner with rigid frame

- Silesian bandage
- Liners, gel, etc.
- Socks
- Elastic belt
- Hip joint and pelvic belt
- Locking mechanisms
- Suction suspension
- Suction with gel liner
- Vacuum assist suspension

Hip Disarticulation/Transpelvic/Translumbar

- One-piece socket design
- Two-piece socket design

- Iliac suspension
- Custom gel liner suspension

5. Supervised assessment, formulation of treatment plan and implementation of device design, fabrication, fitting and patient education:

- Dynamic response feet
- Diagnostic sockets
- Patellar tendon bearing
- Total surface bearing
- Liners, gel, etc.
- Socks
- Suspension sleeves
- Post-op volume management
- Locking mechanisms
- Supracondylar, supracondylar-suprapatellar
- Mechanical knees
- Axis - single, polycentric
- Cadence control - constant friction, fluid
- Ischial containment design variations
- Suction suspension

Spinal Orthoses

- 1. Knowledge of:**
- 2. Knowledge of assessment or supervised assessment:**
- 3. Knowledge of formulation of treatment plan or supervised formulation of treatment plan:**
- 4. Knowledge of follow-up plan:**

- Custom fit cervical orthoses – soft, semi-rigid, rigid (CO)
- Cervical-thoracic orthoses (CTO) - HALO, Minerva
- Cervical-thoracic-lumbar-sacral orthoses (CTLSO) Milwaukee
- Custom fit thoracic-lumbar-sacral orthoses (TLSO) - soft/flexible, sagittal control, sagittal-coronal control
- Custom fit thoracic-lumbar-sacral orthoses - rigid, sagittal control, sagittal-coronal control
- Custom-fabricated thoracic–lumbar-sacral orthoses - rigid, sagittal control, sagittal-coronal control
- TLSOs for treatment of scoliosis: low profile - custom made and custom fit, nocturnal orthoses
- Custom fit lumbar-sacral orthoses – soft/flexible, sagittal control, sagittal-coronal control, posterior-coronal control
- Custom fit lumbar-sacral orthoses - rigid, sagittal control, sagittal-coronal control, posterior-coronal control
- Custom fabricated lumbar-sacral orthoses - rigid, sagittal control, sagittal-coronal control, posterior-coronal control
- Sacral orthoses
- Thigh extensions
- Rotary control techniques
- Trochanteric extension
- Lumbar pads for scoliosis
- Thoracic pads for scoliosis

Cranial Management

- Cranial molding helmet
- Facial orthoses

5. Supervised assessment, formulation of treatment plan and implementation of device design, fabrication, fitting and patient education:

- Custom fit cervical orthoses – soft, semi-rigid, rigid (CO)
- Custom fit thoracic-lumbar-sacral orthoses (TLSO) - soft/flexible, sagittal control, sagittal-coronal control
- Custom fit thoracic-lumbar-sacral orthoses - rigid, sagittal control, sagittal-coronal control
- Custom-fabricated thoracic–lumbar-sacral orthoses - rigid, sagittal control, sagittal-coronal control

Section D RESEARCH

The graduate must demonstrate the ability to perform, at an autonomous level, literature reviews as an effective component of evidence-based-practice 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 student must be able to articulate how the theoretical concepts learned within didactic coursework are exemplified in clinical settings within all of the domains listed. The student also must have had opportunities to, under supervision, participate and demonstrate novice skills within any or all of these domains.

- E.1 Patient 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/practitioner encounters for clinical decision making, communication, legal and reimbursement purposes
- E.6 Interpersonal communication among practitioners, patients, caregivers and others encountered in the clinical environment
- E.7 Business management functions within the orthotic/prosthetic practice