MEDEX Northwest

General Information

For More Details and Interesting Information
visit our website at:

http://www.medex.washington.edu

Find Information About:

• MEDEX Mission & History
• Faculty, Staff, & Students
• Frequently Asked Questions
• Statistics & Expenses
• Degree Options & Training Sites
• Academic & Clinical Prerequisites
• Application Materials
• Admissions Timeline

Explore State and National Physician Assistant Organization websites:

National PA websites:

http://www.aapa.org
http://www.nccpa.net
http://www.paeaonline.org

WWAMI State PA websites:

Washington: http://www.wapa.com
Wyoming: http://www.wapa.net
Alaska: http://www.akapa.org
Montana: http://www.mtapa.com
Idaho: http://www.idahopa.org
Step 1: The CASPA Application

**CASPA Application: Open May 1st to October 1st**

The CASPA application opens May 1st and can be found at [https://portal.caspaonline.org/](https://portal.caspaonline.org/). Submit the CASPA application on or before the final application deadline of October 1st. CASPA will begin the verification process only after the application has been submitted, official transcripts have been received, and reference letters have been sent. Once CASPA completes the verification process, applications will be released to MEDEX for screening and review.

You must submit your application to CASPA prior to the application deadline of October 1st to be considered for admissions to MEDEX Northwest. We will review all applications submitted to CASPA by the application deadline.

If you have questions about the CASPA application, please contact CASPA directly at caspainfo@caspaonline.org.

Step 2: The Supplemental Application

**Supplemental Application: Open May 15th to October 1st**

The Supplemental Application can be accessed on the Apply to MEDEX web page at [http://www.medex.washington.edu](http://www.medex.washington.edu). Review the application instructions for general details and for what may be expected during the next cycle. You can begin the MEDEX Supplemental Application as soon as you have the eleven-digit CASPA ID number.

The MEDEX Supplemental Applications **must** also be submitted before our screening and review process will begin.
Applying to the UW

Please **do not** apply to the University of Washington at the same time as applying to MEDEX Northwest. We will provide details about how and when to apply to the University of Washington undergraduate or graduate admissions office after students are selected.

Applying for Financial Aid

Applications for financial aid for each academic year will be available annually in December. **Do not wait** for acceptance into the MEDEX program to apply for financial aid. Many students apply for financial aid, and the funds available are limited. An early application gives you a better chance of receiving financial aid. The Free Application for Federal Student Aid (**FAFSA**) can be found at [http://www.fafsa.ed.gov/](http://www.fafsa.ed.gov/).


More information about financial aid, grants, and loans can be found at [http://www.medex.washington.edu](http://www.medex.washington.edu)

Interviewing with MEDEX Northwest

**MEDEX Northwest Selection Conference:**

MEDEX Northwest Interview Selection Conferences are held between October and January each application cycle. Applicants invited to interview will be notified two to three weeks in advance of the Selection Conference date.
All applicants, regardless of the degree option they are applying to, are required to meet the minimum academic prerequisites and 2,000 hours of paid, direct hands-on clinical patient care experience. Our students average 6.5 years of paid experience in the direct delivery of patient care, usually in a primary care setting.

Common, competitive, direct patient care experience includes experience in the military (medic, corpsman, pararescueman, etc.), in emergency medicine (EMT, paramedic, emergency department technician, etc.), in nursing (registered nurse, license practical nurse, certified nursing assistant, etc.), medical assistant, and community health aide/practitioner (CHA/CHP).

Other acceptable allied health fields include: mental health practitioner, international medical graduate, laboratory/medical technician, radiology technician, clinical researcher, chiropractor, massage therapist, and emergency room or clinical scribe. While these allied health fields may meet the clinical prerequisite, they are also considered fairly specialized.

If your clinical experience is considered specialized, clinical volunteerism is a way of supplementing and strengthening your clinical experience background.

Positions in medical billing, medical records, medical interpreter, medical transcriptionist, patient scheduler, and anything considered administrative in nature are NOT considered direct patient care and will not fulfill the MEDEX clinical prerequisite.

We strongly encourage spending time as a volunteer and shadowing a PA. It is valuable experience, adds to an understanding of the PA role in healthcare, and expands the understanding of primary care.

Volunteer and shadowing experience is a great way to supplement your experience but does not replace any clinical paid time.

More information regarding Clinical Prerequisites can be found at: http://www.medex.washington.edu
Each prerequisite course must be completed, prior to the application deadline, with a B- (2.7-CASPA) or better (per class). Each of our prerequisite courses must be taken as "stand alone" courses, separate from any prior certificate-training program. Courses can be taken at any regionally accredited community college or university for a grade. This may include some college courses completed on-line, but check the accreditation of the on-line institution before registering for courses. It is strongly recommended that the prerequisite courses be completed within the last five (5) to seven (7) years.

Required MEDEX Master’s and Bachelor’s Prerequisites:

Two (2) Human Anatomy & Physiology courses – 10 quarter/6 semester credits
Courses can be combined A&P courses or individual Human Anatomy and Human Physiology.
We recommend a cadaver or pro-section lab, if available.

One (1) General Biology course – 5 quarter/3 semester credits
We recommend a lab, if available.
General, Cellular, Molecular, or Human Biology will be considered.

One (1) Microbiology course – 5 quarter/3 semester credits
General Microbiology or Microbiology for Health Sciences will be considered.
200-level (or higher) courses are recommended.

One (1) Chemistry course – 5 quarter/3 semester credits
We recommend a lab, if available.
Biochemistry, Organic, Inorganic, and General Chemistry will be considered.

One (1) Statistics course – 5 quarter/3 semester credits
Can be taken within any department. Biostatistics recommended.

Two (2) English courses – 10 quarter/6 semester credits
At least one of these must be a Composition course.
Both courses must be 100 level or higher and be completed within the English department.

Recommended Coursework:
In addition to the required courses listed above we are recommending the following courses to strengthen your application:
Biochemistry
Genetics
Social Sciences (Sociology, Psychology, Anthropology)
Master of Clinical Health Services:
Offered in Seattle, Spokane, & Anchorage, AK

Additional Graduate School Requirements:

Baccalaureate Degree (no major preference)

Applicants applying for the Master’s program must have a prior Bachelor’s degree or be able to verify completion of a Bachelor’s degree by December in the same application year.

General Records Examination (GRE)

GRE scores must be no older than 5 years and are required as part of the CASPA application. Official scores can be sent directly to CASPA using code 0548 and should be self-reported on the CASPA application. MEDEX has not placed a minimum required score on the GRE for this application cycle. We encourage applicants to prepare to score well on the exam. The GRE is not required for applicants with a prior Master’s degree earned at a regionally accredited institution. After being accepted to MEDEX, students will also be asked to submit GRE scores to UW.

GPA Requirements

The University of Washington Graduate School requires overall minimum GPA of 3.0 or higher for the last 2 years coursework (90 quarter or 60 semester credits). Any coursework completed after your Bachelor’s degree will be included in this calculation. Competitive applicants will commonly have a cumulative GPA between a 3.2 and 3.5 (or higher).

TOEFL Requirements

The Test of English as a Foreign Language (TOEFL) is required by UW Graduate School for foreign applicants who did not complete a bachelors degree at an institution in the US, UK, Ireland, Australia, New Zealand or Canada. The completion of college-level English courses at a community college in the United States does not replace the need for the TOEFL exam scores.
University of Washington Admissions - College Academic Requirements for Admissions

UW admission requirements must be satisfactorily completed before the first quarter (summer) of enrollment at the UW. Almost all applicants will have satisfied these requirements through high school course work, which is generally defined as that completed in grades 9-12. If you completed a portion of the core requirements in high school, you need to supplement high school courses with college course work.

<table>
<thead>
<tr>
<th>Subject</th>
<th>High School Years Required</th>
<th>OR</th>
<th>College Courses Required*</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>4 years</td>
<td></td>
<td>4 courses</td>
</tr>
<tr>
<td>Mathematics</td>
<td>3 years</td>
<td></td>
<td>3 courses</td>
</tr>
<tr>
<td>Social Science</td>
<td>3 years</td>
<td></td>
<td>3 courses</td>
</tr>
<tr>
<td>Foreign language</td>
<td>2 years</td>
<td></td>
<td>2 courses</td>
</tr>
<tr>
<td>Science</td>
<td>2 years</td>
<td></td>
<td>2 courses</td>
</tr>
<tr>
<td>Fine, Visual, or</td>
<td>0.5 years</td>
<td></td>
<td>1 course</td>
</tr>
<tr>
<td>Performing Arts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Academic Electives</td>
<td>0.5 years</td>
<td></td>
<td>1 course</td>
</tr>
</tbody>
</table>

*Each course must be at least 5 quarter or 3 semester credits

MEDEX students most commonly need to supplement their Mathematics and Foreign Language high school coursework with college courses.

UW Admissions requirements are detailed on the UW web site:
http://admit.washington.edu/Admission/Transfer/CADR
Information regarding CADR for homeschooled applicants is available at the following:
http://admit.washington.edu/Admission/Transfer/Homeschool
UW Admissions Transfer Credit Policies are detailed on the UW web site:
http://admit.washington.edu/Requirements/Transfer/Plan/CreditPolicies

Questions about whether you meet UW admissions requirements should be referred to the UW admissions office (206) 543-9686. askuwadm@u.washington.edu
BCHS: UW Areas of Proficiency

In addition to the regular MEDEX coursework, the University of Washington requires Bachelor’s Degree students to complete coursework in Areas of Proficiency (AoK) for graduation. These Areas are:

- English Composition
- Additional Writing (7 credits)
- Quantitative and Symbolic Reasoning (Q/SR)
- Areas of Knowledge (AoK) 40 credits, distributed

### How these are fulfilled:

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Course Details</th>
<th>Are additional courses outside of MEDEX coursework needed?</th>
</tr>
</thead>
<tbody>
<tr>
<td>English Composition</td>
<td>Satisfied by the same course as the MEDEX prerequisite in English writing</td>
<td>No</td>
</tr>
<tr>
<td>Additional Writing</td>
<td>This will be satisfied by the MEDEX preceptorship, during Senior year of the BCHS degree program.</td>
<td>No</td>
</tr>
<tr>
<td>Q/SR</td>
<td>Satisfied by the same course as the MEDEX prerequisite in Statistics or Chemistry</td>
<td>No</td>
</tr>
<tr>
<td>AoK</td>
<td>40 credits, distributed over three areas</td>
<td>YES</td>
</tr>
</tbody>
</table>

Areas of Knowledge (AoK) credits must be fulfilled **IN ADDITION TO** regular MEDEX coursework. While in the Physician Assistant training program, there is one open summer quarter between year one and year two in which PA students are encouraged to take the AoK courses. Also, before being admitted to MEDEX, students may wish to work toward this requirement through comparable courses at other universities or colleges.

**Distribution of Areas of Knowledge credits:**

The 40 Areas of Knowledge (AoK) credits must be in the following three areas, with at least 10 credits, and no more than 15, in each area:

- Visual, Literary, & Performing Arts (VLPA)
- Individuals and Societies (I&S)
- The Natural World (NW)
Degree Requirements Planning Worksheet

Proficiency Requirement

- **X** English Composition - English Comp. prerequisite satisfies this requirement
- **X** Additional Writing 7 cr. - MEDEX preceptorship satisfies this requirement
- **X** QSR (Quantitative and Symbolic Reasoning) – Statistics/Chemistry prerequisite satisfies this requirement

Areas of Knowledge: 40 credits. At least 10 credits in each group, and no more than 15 in any one area.

<table>
<thead>
<tr>
<th>Visual, Literary &amp; Performing Arts (VLPA)</th>
<th>Individuals &amp; Society (I&amp;S)</th>
<th>Natural World (NW)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>A&amp;P (5-10 credits)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Biology (5 credits)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Microbiology (5 credits)</td>
</tr>
</tbody>
</table>

**Visual, Literary, & Performing Arts (VLPA)**

Courses in this area focus on the history, interpretation, criticism, and practice of the arts. The requirement is meant to help you develop a personal appreciation of the creative process. Examples of departments that offer such courses include art history, classics, dance, drama, English, music, and foreign languages. Most speech courses also count in this area.

**Typically, MEDEX students need additional courses to meet this requirement.**

**Individuals and Societies (I&S)**

This area includes a wide variety of options for the study of human beings and societies. Courses focus on the history, development, and dynamics of human behavior, as well as social and cultural institutions and practices. Departments that offer such courses include American ethnic studies, anthropology, economics, geography, international studies, political science, psychology, sociology, and women studies. I&S includes from departments such as history, philosophy, and religion courses traditionally grouped with “humanities” at other colleges.

**Recommended social science prerequisites will meet part of this requirement.**

**The Natural World (NW)**

Courses in this area focus on the disciplined, scientific study of the natural world. The area can be divided into three broad categories; the mathematical sciences, the physical sciences, and the biological sciences. Departments that offer such courses include astronomy, biology, chemistry, fisheries, forest resources, geology, mathematics, and oceanography.

**MEDEX science prerequisites will meet this requirement.**

Upper division Courses (non-major) 12 credits - MEDEX summer A & P and Basic Sciences satisfies this requirement.
Application Checklist

Have you…?

Completed Required MEDEX Prerequisites:

___ Academic Prerequisites
    - A&P (2)
    - Biology (1)
    - Chemistry (1)
    - Microbiology (1)
    - Statistics (1)
    - English (2)

___ Clinical Prerequisites
    - 2,000 paid hours

Completed Additional MCHS Requirements (Master’s Applicants Only):

___ Undergraduate Degree (before Dec. 31st)
___ GRE (Graduate Records Examination)
___ 3.0 GPA (recent 90 credits)

Met UW Entry Requirements (Bachelor’s Applicants Only):

___ Completed all Coursework
    - English
    - Mathematics
    - Social Science
    - Foreign Language
    - Science
    - Arts
    - Academic Electives

Gathered Documents for Application:

___ Official Transcripts
___ 3 References
___ Personal Statements

Gathered Military Documents (Veterans/Active Duty Military Only):

___ DD-214 / Proof of Service
___ Joint Service or Other Military Transcripts

Met the International Requirements (IMGs Only):

___ TOEFL
___ Course-by-Course Evaluation of all International Transcripts
___ U.S. English courses

(Optional) MEDEX Recommendations:

___ Academic Prerequisites
    - Social Sciences
    - Biochemistry
    - Genetics
___ PA Shadowing
___ Volunteering (Clinical or Otherwise)
___ Additional Reference
___ Additional Clinical Experience (4,000 hrs)

You are now prepared to apply to MEDEX Northwest!

See the Application Details handout in your folder for more information.

The application cycle opens in May and closes on October 1st each year.
What Is a PA?
A physician assistant is a graduate of an accredited PA educational program who is nationally certified and authorized by the state to practice medicine with the supervision of a licensed physician. PAs are invaluable members of the healthcare team and work in concert with physicians to ensure the highest quality of care for patients.

To Become a Physician Assistant

ATTEND AN ACCREDITED PA PROGRAM...
- The typical entering student has a bachelor's degree and approximately four years of healthcare experience.
- The average program takes 27 months to complete.

...WITH CLASS/LAB INSTRUCTION
PA students take more than 400 hours in basic sciences (with more than 75 hours in pharmacology) plus approximately 175 hours in behavioral sciences and nearly 580 hours of clinical medicine. Subjects include:
- Anatomy
- Pathology
- Pharmacology
- Biochemistry
- Clinical laboratory sciences
- Microbiology
- Physical diagnosis
- Differential diagnosis
- Pathophysiology
- Medical ethics
- Behavioral sciences
- Physiology

...AND CLINICAL ROTATIONS
PAs participate in more than 2,000 hours of clinical rotations, with an emphasis on primary care in ambulatory clinics, physicians' offices and acute/long-term care facilities. Rotations include:
- Family medicine
- General surgery
- Pediatrics
- Psychiatry
- Emergency medicine
- Obstetrics/gynecology
- Internal medicine

To Practice as a Physician Assistant

INDIVIDUALS MUST
- Pass a national PA certification exam administered by the National Commission on Certification of Physician Assistants (for graduates of accredited PA programs only).
- Obtain a state license

To Maintain Certification

PAs MUST
- Complete 100 hours of continuing medical education over a two-year cycle.
- Pass a recertification exam every six years.
Where Do PAs Practice?

More than 90,000 certified physician assistants work in virtually every medical and surgical setting across the country. More than one-third (39.4 percent) practice in hospital settings and close to 40 percent work in a group practice or solo physician office. The remaining PAs work in a variety of settings, including community health centers, freestanding surgical facilities, nursing homes, school- or college-based facilities, industrial settings and correctional institutions.

What Can a PA Legally Do?

Physicians may delegate to PAs medical duties that are within the physician’s scope of practice, the PA’s training and experience and that are allowed by law.

These duties include performing physical examinations, diagnosing and treating illnesses, ordering and interpreting lab tests, assisting in surgery, providing patient education and counseling, and making rounds in nursing homes and hospitals. All states, the District of Columbia, the Commonwealth of the Northern Mariana Islands, and Guam and the U.S. Virgin Islands authorize physicians to delegate prescriptive privileges to the PAs they supervise.

Why Was the Profession Created?

Recognizing that some residents of North Carolina had limited access to quality medical care, the chair of the Department of Medicine at the Duke University Medical Center established a program in 1965 to educate ex-military corpsmen to practice medicine with physician supervision. The educational model for PAs was based in part on his experience with the fast-track training of doctors during World War II. These first students had received extensive healthcare training during their military careers.

What About Reimbursement for Services Provided by PAs?

PAs offer great value to their employers by providing high quality medical and surgical care to patients for which most public and private third party payers reimburse. Services provided by PAs are billed under the PA's name or under the name of the supervising physician, depending on the policies of the individual payer. Most federal and state healthcare reform initiatives recognize and include PAs as vital members of the healthcare team.

And the Quality of PA Care?

Numerous studies have found that the quality of care that PAs provide is comparable to that of physicians. The congressional Office of Technology Assessment studied healthcare services provided by PAs and determined that "physician assistants provide health care that is indistinguishable in quality from care provided by physicians." Additionally, according to a study published in The American Surgeon in 2004, PAs “are a valuable adjunct in improving quality of patient care.” And PAs provide quality of care comparable to physicians according to a 2009 Rand Report that confirmed the conclusions of two reviews of published studies. A nationwide study published in 2005 also found that, regardless of provider, Medicare patients are generally satisfied with the quality of health care they receive.
Physician Assistants in Primary Care

Physician assistants (PAs) offer continuity, comprehensiveness and coordination of care, all vital components of the medical home. As Dr. Hauer states in the Journal of the American Medical Association, “traditional practice...is shifting to collaborative models that include physicians from multiple specialties, nurses, nurse practitioners, physician assistants and other health professionals. This primary care paradigm will enable professionals to adapt to the changing demographics and needs of patients seeking primary care.”

PAs are licensed professionals who provide medical care with physician supervision. PAs are educated in intensive programs accredited by the Accreditation Review Commission on Education for the Physician Assistant. Programs are characterized by a rigorous competency-based curriculum with didactic and clinical components. This education prepares PA students to practice with physicians in any specialty.

Today there are nearly 75,000 PAs in clinical practice; 36 percent (27,000) practice in primary care specialties. The profession’s flexibility — a relatively short, academically intense educational pipeline producing well-prepared generalist medical clinicians — is an asset for a health system with rapidly changing priorities.

PA Scope of Practice

PA scope of practice is defined by education, experience, state law, facility/practice policy and physician delegation.

PA licensing laws and regulations are broadly written to allow maximum flexibility at the practice level. These
laws leave most delegatory decisions to the supervising physician. In all states, the District of Columbia, the Commonwealth of the Northern Mariana Islands and Guam, physicians may delegate prescriptive privileges to the PAs they supervise. The majority of states include controlled medications as part of this prescriptive authority. All laws allow off-site physician supervision as long as they are available to the PA via telecommunication.

PAs provide medical care, consult with supervising physicians and colleagues, and refer patients to specialists when necessary. PAs perform physical examinations, diagnose and treat illnesses, order and interpret lab tests, and provide patient education. They prescribe medications, manage patients with chronic conditions, perform minor surgical procedures and make rounds at nursing homes and hospitals.

Research consistently finds that PAs provide care equivalent in quality to that of physicians and are widely accepted by patients.3-6

PA Roles in Primary Care

PAs in primary care treat diverse patient groups — the elderly, children and families, the underserved and veterans — in varied settings.

Caring for the Elderly

Many PAs treat elderly patients: 90 percent of all PAs report caring for persons aged 65-84 years, and 80 percent care for patients 85 years old and older.7 PA graduates are well-grounded in geriatric care. Accreditation standards require that PA programs provide students with clinical experiences in the long-term care setting and in geriatrics.

In Durham, N.C., PAs care for 300 low-income seniors in Duke’s “Just for Us” program. The PAs are part of a multidisciplinary team providing primary care house calls. The visits are key to Duke’s medical home approach to family medicine.7

In the northeastern US, two PAs provide care at a 360-bed skilled nursing facility. The supervising geriatrician and other physicians come in three times a week. Having the PAs available provides continuity of care and helps reduce hospitalizations.8

Caring for Children and Families

The breadth of PA education creates clinicians who are well-suited to the challenges of family practice. Eighty percent of PAs in family medicine report that they care for newborns, 85 percent see babies and older children and 95 percent treat adolescents.2

Twenty-five years ago, two physicians who shared a philosophy of serving patients where they lived created a family practice near Puget Sound, Wash. Today, the practice has 15 physicians, 10 PAs and two nurse practitioners (NPs) providing care in three locations to 27,000 patients a year. The PAs provide comprehensive care at three offices and cover two urgent care facilities that have evening and weekend hours.9

Caring for the Underserved

PAs care for medically underserved populations, such as frontier communities, rural towns, the urban poor and at-risk groups such as the elderly. Federally qualified health centers (FQHCs) are a mainstay for under- and uninsured patients. Nearly 20 percent of PAs in primary care (6,000 PAs) work in urban and rural FQHCs, community health centers and certified rural health clinics.2

A native resident of Tangier Island in Virginia graduated from PA school in 2006 and became the island's first
full-time medical professional. For years, the island’s 600 residents were served by mainland physicians and PAs who traveled there once a week. The physicians still supervise and visit, but since the PA lives on the island, care is more readily accessible.10

In Alaska, one PA who was born and raised in a Yupik/Aleut family provides care at a regional hospital serving 56 villages. “They call me ‘the doctor’ or ‘our Native doctor,’” she says. “I tell them that I’m not a doctor, but they disregard that. They know that I’m not a doctor of medicine, but I think that in their eyes, I am their doctor.”11

Caring for Our Nation’s Veterans

The first PA graduates were former medical corpsmen who served in Vietnam. This veteran/PA connection continues today. PA programs currently recruit medics who have served in Afghanistan and Iraq, and PA graduates provide medical care in Iraq and Afghanistan as active duty service members.

A psychiatric nursing home unit of a Veterans Affairs Medical Center (VAMC) in Kansas hired a PA with seven years of internal medicine experience. On a typical day, after rounds with the treatment team, the PA performs admissions, orders consults and coordinates the patients’ medical needs. (AAPA interview)

A team of seven physicians, 10 PAs and two NPs staff the primary care medicine clinics of one Pennsylvania VAMC. One PA on the team says she enjoys the variety in her work and the flexibility she has had to practice in other specialty areas within the center. In addition, she conducts exams for the Agent Orange and Gulf War registries, assignments that required specialized training. (AAPA interview)

Caring for Rural Communities

Nationally, 15 percent of all PAs practice in rural areas, and often the PA is the only medical provider in the community.2

A PA began practicing in a small West Virginia town 30 years ago, when the town had no resident physician; the last full-time physician practiced there in the 1960s. Even today, the nearest full-time doctor is 16 miles away. The clinic sees 6,000 patients a year; 20 percent are indigent and nearly 40 percent are uninsured.12

Horizon Healthcare, Inc., has 10 community health centers across South Dakota that provide primary care for all ages. The staff includes six physicians, 10 PAs, four dentists and three NPs. All the PAs are family medicine providers and their clinical interests include emergency medicine, prevention, geriatrics, cancer awareness and women’s health.13

The PA Answer

PAs are high-quality, cost-effective members of primary care. Their generalist education, grounding in team practice and ability to expand access to care make them ideal practitioners for the needs of 21st century health care. For more information about PA education and scope of practice, visit AAPA’s Resources page at www.aapa.org/advocacy-and-practice-resources/issue-briefs.
REFERENCES


