Behavioral Health

New for 2021 – 2022
Discovering Psychology: The Science of the Mind 4th edition has been released.

Event Summary
Behavioral Health provides members with the opportunity to gain knowledge and skills surrounding psychology, the mind, mental health, and substance use disorders. This competitive event consists of a written test with a tie-breaker essay question. This event aims to inspire members to learn about and promote mental health resilience as well as learn how to support those in recovery, their families, and the health community.

Dress Code
Competitors must be in official HOSA uniform or proper business attire. Bonus points will be awarded for proper dress.

General Rules
1. Competitors in this event must be active members of HOSA-Future Health Professionals and in good standing.

2. Secondary and Postsecondary/Collegiate divisions are eligible to compete in this event.

3. Competitors must be familiar with and adhere to the “General Rules and Regulations of the HOSA Competitive Events Program (GRR).”

4. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitor’s photo ID must be presented prior to ALL competition rounds.

Official References
- Substance Abuse and Mental Health Services Administration website
- National Alliance on Mental Illness website
- CVS Opioid Abuse Prevention

Written Test
5. Test Instructions: The written test will consist of 100 multiple choice items in a maximum of 90 minutes.

6. Time Remaining Announcements: There will be a verbal announcement when there are 60 minutes, 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.

7. One essay question will be administered with the original test. In case of a tie, the essay question will be judged and used to break the tie.
8. The test plan and resources for Behavioral Health Test are:
   • The Mind ........................................................................................................25%
     o Biological
     o Sensation
     o Perception
     o Consciousness
     o Motivation
     o Emotion
     o Learning
     o Memory
   • Psychology and Behavioral Health Disorders, Treatments, Therapies & Services
     .......................................................................................................................25%
     o Autism
     o ADHD
     o Schizophrenia
     o Bipolar
     o Depression
     o Anxiety
     o OCD
     o PTSD
     o Personality Disorders
     o Dissociative Disorders
     o Eating Disorders
   • Prevention, Identification, Recovery and Management of Substance Abuse and Mental Illness .................................................................25%
   • Wellness, Stress, Coping ...........................................................................15%
   • Workforce/Careers and Laws, Regulations and Guidelines ....................5%
   • History and Health Systems Integration .....................................................5%

NOTE: Chartered associations/regions may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Area/Region/State/Chartered Association for the process you will be using.

9. Sample Test Questions
   1. Which part of the nervous system manages essential functions, such as heart rate, breathing, and blood pressure?
      A. Cerebellum
      B. Pons
      C. Medulla
      D. Cerebellum
      Cacioppo Page 115

   2. A student is seeking a counselor to work on individual strategies to develop knowledge, attitudes and skills needed to change certain behaviors. Which of the following elements is not considered a component of an effective program?
      A. Focusing on life and social skills.
      B. Peer support services.
      C. Focusing on physical skills.
      D. Social commitment to not using drugs.
      SAMHSA
3. What percent of U.S. children ages 4-17 have ADHD?
   A. 3.9%
   B. 8.8%
   C. 12.5%
   D. 15.6%

Final Scoring

10. The competitor should write his/her answer to the tie-breaker essay question on the tie-breaker page of the test that remains attached to the original test.
11. Final rank is determined by the test score. In case of a tie, the essay question will be used to determine the rank.

Competitor Must Provide:
- Two #2 pencils with erasers
- Photo ID
Cultural Diversity & Disparities in Healthcare

New for 2021-2022

Editorial changes have been made for clarity.

Event Summary
Cultural Diversity & Disparities in Healthcare provides members with the opportunity to gain knowledge and skills regarding cultural competence in the promotion of better health. This competitive event consists of a written test with a tie-breaker essay question. This event aims to inspire members to learn about cultural diversity, identify disparities in healthcare, and understand cultural differences.

Dress Code
Competitors must be in official HOSA uniform or proper business attire. Bonus points will be awarded for proper dress.

General Rules
1. Competitors in this event must be active members of HOSA-Future Health Professionals and in good standing.
2. Secondary and Postsecondary/Collegiate divisions are eligible to compete in this event.
3. Competitors must be familiar with and adhere to the “General Rules and Regulations of the HOSA Competitive Events Program (GRR).”
4. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitors’ photo ID must be presented prior to ALL competition rounds.

Official References
- Spector, Rachel E. Cultural Diversity in Health and Illness. Prentice Hall.
- https://medlineplus.gov/healthdisparities.html

Written Test
5. Test Instructions: The written test will consist of 100 multiple choice items in a maximum of 90 minutes.
6. Time Remaining Announcements: There will be a verbal announcement when there are 60 minutes, 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.
7. One essay question will be administered with the original test. In case of a tie, the essay question will be judged and used to break the tie.
8. The test plan and resources for Cultural Diversity and Disparities in Healthcare are:

- Cultural Foundations 15%
- Health Disparities & Diversity 20%
- Health Traditions & Cultural Competence 15%
- Religion, Rituals, Health and Illness
  - Native American Heritage 10%
  - Asian Heritage 10%
  - African Heritage 10%
  - Hispanic/Latino Heritage 10%
  - European Heritage 10%

**NOTE:** Chartered associations/regions may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Area/Region/State/Chartered Association for the process you will be using.

9. **Sample Test Questions**

1. As described by O’Neil, what is the term for the social and sometimes physical characteristics used to classify people into groups or categories considered to be significantly different from others?
   A. Race
   B. Nationality
   C. Culture
   D. **Ethnicity**

   Spector Page 21

2. What year was the *CDC Health Disparities and Inequalities Reports* first published?
   A. 2010
   B. **2011**
   C. 2012
   D. 2013
   CDC

3. According to WHO estimates, how many people worldwide suffer from one or more neglected diseases?
   A. 10 million
   B. 100 million
   C. **1 billion**
   D. 10 billion

   NIH Medline Plus

**Final Scoring**

10. The competitor should write his/her answer to the tie-breaker essay question on the tie-breaker page of the test that remains attached to the original test.

11. Final rank is determined by the test score. In case of a tie, the essay question will be used to determine the rank.

**Competitor Must Provide:**

- Two #2 lead pencils with an eraser
- **Photo ID**
Dental Terminology

New for 2021-2022
The fourth edition of Dental Terminology by Dofka has been released. The test plan has been revised.

Event Summary
Dental Terminology provides members with the opportunity to gain knowledge and skills regarding language common to all dental careers and specialties. This competitive event consists of a written test with tie-breaker questions. This event aims to inspire members to learn about dental terminology, physiology, and pathophysiology.

Dress Code
Competitors must be in official HOSA uniform or in proper business attire. Bonus points will be awarded for proper dress.

General Rules
1. Competitors in this event must be active members of HOSA-Future Health Professionals and in good standing.
2. Secondary and Postsecondary/Collegiate divisions are eligible to compete in this event.
3. Competitors must be familiar with and adhere to the “General Rules and Regulations of the HOSA Competitive Events Program (GRR).”
4. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitor’s photo ID must be presented prior to ALL competition rounds.

Official References

Written Test
5. Test Instructions: The written test will consist of 100 multiple choice items in a maximum of 90 minutes.
6. Time Remaining Announcements: There will be a verbal announcement when there are 60 minutes, 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.
7. A series of twenty (20) tie breaking questions will be administered with the original test. The tiebreaker, correct spelling is required for an item to be considered correct.
8. The test plan for the Dental Terminology test is:

- Comprehensive Dental Care and Dental Specialties (related procedures, terminology and spelling) 20%
  - General Dentistry
  - Oral and Maxillofacial Surgery
  - Cosmetic Dentistry
  - Pediatric Dentistry
  - Prosthodontics
  - Endodontics
  - Orthodontics
  - Periodontics
  - Implant Dentistry
  - Dental office laboratory and equipment

- Dental Instruments 10%
- Dental Materials 5%
- Prefixes, Suffixes and Nomenclature 5%
- Preventative Dentistry 3%
- Dental Disease and Oral Pathology 4%
- General Anatomy & Physiology of Head 4%
- Head and Neck Anatomy 4%
- Intraoral and Extraoral Landmarks 4%
- Tooth Morphology 4%
- Intraoral and Extraoral Exam and Charting 6%
- Infection Control/Occupational Health and Safety 16%
- Dental and Medical Emergencies 7%
- Dental Ethical and Jurisprudence Legal 3%
- Radiography 5%

**NOTE:** Chartered associations/regions may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Area/Region/State/Chartered Association for the process you will be using.

9. Sample Test Questions

1. What ridge occurs on the occlusal surface of posterior teeth at a point where two triangular ridges meet?
   A. Marginal ridge
   B. Oblique ridge
   **C. Transverse ridge**
   D. Triangular ridge
   
   Dofka Page 52

2. Which suffix refers to knowledge?
   A. -algia
   B. -gnosis
   C. -ology
   D. -trophy
   
   Dofka Page 10
3. What double-ended hand instrument with a pointed tip on one end and a disc-shaped blade on the other end is used to create anatomy features in newly placed restorations?
   A. Cleoid carver
   B. Hatchet
   C. Chisel
   D. Hoe

   Stedman’s Page 127/Dofka Page 66

**Final Scoring**

10. Final rank is determined by the test score. In case of a tie, successive sets of five tie-breaker questions will be used until a winner is determined.

**Competitors Must Provide:**
- Two #2 pencils with erasers
- Photo ID
Human Growth & Development

Event Summary
Human Growth & Development provides members with the opportunity to gain knowledge and skills regarding biophysical, mental/cognitive, social, and emotional development in the human life span. This competitive event consists of a written test with a tie-breaker essay question. This event aims to inspire members to learn more about growth and development across the life span.

Dress Code
Competitors must be in official HOSA uniform or proper business attire. Bonus points will be awarded for proper dress.

General Rules
1. Competitors in this event must be active members of HOSA-Future Health Professionals and in good standing.
2. Secondary and Postsecondary/Collegiate divisions are eligible to compete in this event.
3. Competitors must be familiar with and adhere to the “General Rules and Regulations of the HOSA Competitive Events Program (GRR).”
4. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitor’s photo ID must be presented prior to ALL competition rounds.

Official References

Written Test
5. **Test Instructions:** The written test will consist of 100 multiple choice items in a maximum of 90 minutes.
6. **Time Remaining Announcements:** There will be a verbal announcement when there are 60 minutes, 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.
7. One essay question will be administered with the original test. In case of a tie, the essay question will be judged and used to break the tie.
8. The test plan for Human Growth & Development is:
   - Healthy People 5%
   - Government influence on Health 6%
   - Cultural considerations 5%

New for 2021-2022
9th Edition of DHO Health Science has been released.
• Family Influences 10%
• Theories of Development 10%
• Prenatal 7%
• Infant 5%
• Early Childhood 10%
• Middle Childhood 6%
• Adolescence 5%
• Adulthood 15%
• Advanced old age and Geriatrics 5%
• Planning for end of life 3%
• Loss, Grief and Bereavement 5%
• Communication 3%

NOTE: Chartered associations/regions may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Area/Region/State/Chartered Association for the process you will be using.

9. Sample Test Questions

1. What is the life stage during which muscle coordination is well developed, and individuals can engage in physical activities that require complex motor-sensory coordination?
   A. Preadolescence
   B. Toddler
   C. Late childhood
   D. Adolescence
   Simmers Page 253

2. In the Family APGAR tool, what does the P represent?
   A. Partnership
   B. Parenting
   C. Preparedness
   D. Presentation
   Leifer Page 44

3. What is the term for the irregular pigmentation of aging skin caused by the uneven distribution of melanocytes?
   A. Keratinization
   B. Senile lentigo
   C. Maldistribution
   D. Atherosclerosis
   Polan Page 203

Final Scoring

10. The competitor should write his/her answer to the tie-breaker essay question on the tie-breaker page of the test that remains attached to the original test.

11. Final rank is determined by the test score. In case of a tie, the essay question will be used to determine the rank.

Competitor Must Provide:
- Two #2 pencils with erasers
- Photo ID
Event Summary

Health Informatics provides members with the opportunity to gain knowledge and skills regarding the management of health information and the assimilation of technology in health care. This competitive event consists of a written test and aims to inspire members to learn about concepts related to the study of informatics.

Dress Code

Competitors must be in official HOSA uniform or in proper business attire. Bonus points will be awarded for proper dress.

General Rules

1. Competitors in this event must be active members of HOSA-Future Health Professionals and in good standing.
2. Secondary and Postsecondary/Collegiate divisions are eligible to compete in this event.
3. Competitors must be familiar with and adhere to the “General Rules and Regulations of the HOSA Competitive Events Program (GRR).”
4. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitor’s photo ID must be presented prior to ALL competition rounds.

Official References


Written Test

5. **Test Instructions:** The written test will consist of 75 multiple choice items in a maximum of 90 minutes.
6. **Time Remaining Announcements:** There will be a verbal announcement when there are 60 minutes, 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.
7. A written tiebreaker will be administered with the original test. In case of a tie, this written response will be judged and used to break the tie.
8. The test plan and resources for Health Informatics:
   - History, Careers and Roles………………………………………………… 5%
   - Healthcare Data and Analytics………………………………………… 10%
   - Electronic Health Records, Information Exchange & Retrieval…… 12%
   - Health Information Privacy & Security………………………………… 5%
   - Health Information Ethics & Governance…………………………… 5%
   - Patient Safety & Consumer Health Information………………… 11%
   - Information Systems In Healthcare Delivery………………………… 10%
   - Evidence Based Clinical Practice……………………………………… 12%
   - Application: EBM Case Studies & Clinical Trials;

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HOSA Health Informatics Guidelines (August 2021)
NOTE: Chartered associations/regions may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Area/Region/State/Chartered Association for the process you will be using.

9. Case studies, clinical trials, and EHRs will be a part of the test and will assess knowledge and skills related to the analysis of background data and information, data entry and retrieval; and risk measures and calculations. A series of multiple-choice questions related to the data will be included.

10. At the International Leadership Conference, HOSA will provide basic handheld calculators (no graphing calculators) for addition, subtraction, division, multiplication, and square root. Check with State Advisor to determine if a calculator will be used at the State level.

11. All competitors will receive two (2) 8.5x11” sheets of blank paper for use during the test.

12. Sample Test Questions

1. In what year was the world’s first computer-aided medical information system installed to aid in actual patient care?
   A. 1958
   B. 1962
   C. 1971
   D. 1983

   Nelson/Staggers Page 597

2. Which discipline is defined as the management of healthcare data and information through the application of computers and other information technologies?
   A. Clinical Informatics
   B. Bioinformatics
   C. Public Health Informatics
   D. Health Informatics

   Hoyt/Hersh Page 2

3. What is the term for online groups in which patients interact, sharing health-related data and learning from each other’s experiences while being unbound by geographic limitations, social stigma, or other limiting characteristics?
   A. Patient-focused virtual communities
   B. ePatient platform
   C. eHealth precision medicine
   D. ePatient exchange

   Nelson/Staggers Page 213

Final Scoring

13. Final rank is determined by the test score. In case of a tie, the essay question will be used to determine the rank.

Competitors Must Provide:
☐ Two #2 pencils with erasers
☐ Photo ID
Medical Law & Ethics

New for 2021-2022
A new resource has been added: Medical Law & Professional Ethics. Editorial updates have been made for clarity.

Event Summary
Medical Law & Ethics provides members with the opportunity to gain knowledge and skills regarding U.S. medical law, ethics and bioethics. This competitive event consists of a written test with a tie-breaker essay question. This event aims to inspire members to learn about ethical and legal terms as well as how to analyze, synthesize and evaluate information related to this field.

Dress Code
Competitors must be in official HOSA uniform or proper business attire. Bonus points will be awarded for proper dress.

General Rules
1. Competitors in this event must be active members of HOSA-Future Health Professionals and in good standing.
2. Secondary and Postsecondary/Collegiate divisions are eligible to compete in this event.
3. Competitors must be familiar with and adhere to the "General Rules and Regulations of the HOSA Competitive Events Program (GRR)."
4. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitor's photo ID must be presented prior to ALL competition rounds.

Official References
  An updated 12th chapter of this book has been released ahead of the new edition coming next year. For HOSA membership year 2021-2022 the updated 12th chapter of this book, as accessed HERE, will be used for test questions at ILC 2021.


Written Test
5. Test Instructions: The written test will consist of 100 multiple choice items in a maximum of 90 minutes.
6. Time Remaining Announcements: There will be a verbal announcement when there are 60 minutes, 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.
7. One essay question will be administered with the original test. In case of a tie, the essay question will be judged and used to break the tie.
8. The test plan for Medical Law & Ethics is:
   - The Basics: Medical Law, Ethics and Bioethics 5%
   - The Legal Environment 35%
• State and Federal Regulations; Consent
• The Legal System; Professional Liability
• Law for Health Professionals; Public Duty

• The Health Care Environment 35%
  • Physician Patient Relationships
  • Medical Malpractice
  • Medical Records
  • Workplace Law and Ethics
  • Cultural Perspective
  • Patient Confidentiality
  • Employment Practices

• Bioethical Issues 25%
  • Ethical and Bioethical Issues in Medicine
  • Allocation of scarce resources
  • Genetic engineering
  • Reproductive Issues
  • End of Life Issues

NOTE: Charter associations may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Area/Region/State/Chartered Association for the process you will be using.

9. Sample Test Questions
   1. Which of the following describes the concept of implied contracts in health care?
      A. An agreement contracted through an independent agent
      B. An enforceable agreement written in distinct clear language
      C. An agreement explained to the patient by the physician
      D. An enforceable agreement without specific written or spoken agreement
         Ritter Page 95

   2. Which of the following entities would not be involved in making macro allocation decisions concerning how much can be expended for medical resources and how the resources are to be distributed?
      A. Local hospitals
      B. State legislatures
      C. Health insurance carriers
      D. Congress
         Lewis Page 183

   3. Before human research can be conducted, all institutions that receive federal research funds must establish which of the following entities?
      A. Institutional Department Chair
      B. Institutional Ethics Committee
      C. Institutional Review Board
      D. Department of Human Services
         Fremgen Page 270

Final Scoring
   10. The competitor should write his/her answer to the tie-breaker essay question on the tie-breaker page of the test that remains attached to the original test.

   11. Final rank is determined by the test score. In case of a tie, the essay question will be used to determine the rank.

Competitor Must Provide:
   - Two #2 lead pencils with an eraser
   - Photo ID
Medical Math

New for 2021-2022
Additional rounding information has been added.
The 9th edition of DHO Health Science by Simmers has been released.

Event Summary
Medical Math provides members with the opportunity to gain knowledge and skills required to identify, solve, and apply mathematical principles. This competitive event consists of a written test with tie-breaker questions. This event aims to inspire members to learn about the integration of mathematics in health care, including temperature, weights, and measures used in the health community.

Dress Code
Competitors must be in official HOSA uniform or in proper business attire. Bonus points will be awarded for proper dress.

General Rules
1. Competitors in this event must be active members of HOSA-Future Health Professionals and in good standing.

2. Secondary and Postsecondary/Collegiate divisions are eligible to compete in this event.

3. Competitors must be familiar with and adhere to the “General Rules and Regulations of the HOSA Competitive Events Program (GRR).”

4. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitor’s photo ID must be presented prior to ALL competition rounds.

Official References

Written Test
5. Test Instructions: The written test will consist of 50 fill-in-the-blank items in a maximum of 90 minutes.

6. Time Remaining Announcements: There will be a verbal announcement when there are 60 minutes, 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.

7. A series of ten (10) complex, multi-step tie breaking questions will be administered with the original test. In case of a tie, successive tie-breaker questions will be used until a winner is determined. In the tiebreaker, correct spelling is required for an item to be considered correct.
8. **Test Plan:**

Mathematical essentials .............................................................. 5%
Measurement and conversion problems .................................... 20%
Drug dosages and intravenous solutions ................................. 35%
Dilutions, solutions and concentrations ................................. 25%
Interpreting medical information ............................................. 15%
   - Charts, graphs, tables
   - Basic statistics: mean, median, mode, standard deviation
   - Calculating body surface

**NOTE:**
1. Abbreviations will be used in the written problems. In addition, the test will use standard medical abbreviations as designated in the Simmers DHO Health Science reference.
2. At least half of the computation and calculation problems will involve conversions.

9. At the International Leadership Conference, HOSA will provide basic handheld calculators (no graphing calculators) for addition, subtraction, division, multiplication and square root. Check with State Advisor to determine if a calculator will be used at the State level.

10. All competitors will receive two (2) 8.5x11” sheets of blank paper for use during the test.

11. The medical math “Reference Materials Summary” included in these guidelines (page 4) will be used as the official reference for the test for uniformity. Competitors may NOT use this summary page or any type of conversion chart or resource during the test.

12. **When a Scantron form is used** – the Scantron form for this event will require competitors to grid-in their responses.

   At the chartered association-level, when a paper/pencil test is used or the test is administered on a computer, the competitor will write in or key in his/her response to each question.

   **Note:** Chartered associations may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Area/Region/State/Chartered Association for the process you will be using.

13. **ROUNDING:** Converting between measurement systems will often render a different answer depending upon which systems and conversions are being used. The answer to a calculation problem will ultimately be the same answer after appropriate rounding. When determining a solution, round only the final answer after all calculation steps have been completed.

   When rounding decimal numbers to the nearest tenths, hundredths, or thousandths, look to the immediate right of the digit located in the position to be rounded. If the number to the direct right is 5 or larger, round to the position up one number and drop everything that follows. If the number to the direct right is 4 or smaller, leave the position being rounded as is and drop everything that follows. In specific situations, answers will be rounded per medical protocol. For example, pediatric dosage is always rounded DOWN to avoid potential overdose. Unless otherwise indicated, all answers should be rounded to the nearest whole number. (Examples: 31.249 (rounded down) = 31 and 23.75 (rounded up) = 24).
14. **Sample Test Questions**

*Competitors will grid-in (or write in) their answers to the test problems.*

1. An IV bag of 500 mL solution is started at 1900. The flow rate is 38 gtts per minute, and the drop factor is 10 gtts per mL. At what time (24-hour clock) will this infusion finish?  
   (Craig pp 174-178)
   
   **Solution**  
   
   \[
   \begin{align*}
   &38 \text{ gtts/1 min} \times 1 \text{ mL/10 gtts} = 3.8 \text{ mL/min} \\
   &3.8 \text{ mL/1 min} \times 60 \text{ min/1 hr} = 228 \text{ mL/hr} \\
   &500 \text{ mL} \times 1 \text{ hr/228 mL} = 2.1929824 \text{ hr} \\
   &0.1929824 \text{ hr} \times 60 \text{ min/1 hr} = 11.578944 \text{ minutes} \\
   &1900 \text{ hr} + 2 \text{ hrs} \times 11.578944 \text{ min} \text{ (Rounded = 12 minutes)} \\
   &2100 \text{ hours} + 12 \text{ min} = 2112 \text{ hours}
   \end{align*}
   \]

   (Helms pp 110-114)
   
   **Solution**  
   
   \[
   95.5 \text{ lb} \times 1 \text{ kg/2.2 lbs} = 43.40909 \text{ kg} \text{ Rounded = 43.4 kg}
   \]

3. How many grams of sodium chloride are needed to prepare 500 mL of a 5% solution?  
   (Olson pp214-227)
   
   **Solution**  
   
   \[
   5% = 5 \text{ g/100 mL} = 0.05 \text{ g/1 mL} \\
   0.05 \text{ g/1 mL} \times 500 \text{ mL} = 25 \text{ g}
   \]

**Final Scoring**

15. Final rank is determined by the test score. In case of a tie, the tie-breaking questions will be used to determine the rank.

**Competitor Must Provide:**

- Two #2 lead pencils with eraser
- Photo ID
### METRIC EQUIVALENTS

#### Length

<table>
<thead>
<tr>
<th>Metric</th>
<th>Equivalent</th>
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<tbody>
<tr>
<td>1 meter (m) = 100 centimeters (cm) = 1000 millimeters (mm)</td>
<td>1 centimeters (cm) = 10 millimeters (mm)</td>
</tr>
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#### Temperature

<table>
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<th>Metric</th>
<th>Formula</th>
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<tbody>
<tr>
<td>°C (Degrees Celsius)</td>
<td>(°F - 32) × 5/9</td>
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<tr>
<td>°F (Degrees Fahrenheit)</td>
<td>(°C) × 9/5 + 32</td>
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#### Weight

<table>
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<th>Equivalent</th>
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<td>1 kilogram (kg) = 1000 grams (g)</td>
<td>1 gram (g) = 1000 milligrams (mg)</td>
</tr>
<tr>
<td>1 gram (g) = 1000 milligrams (mg)</td>
<td>1 milligram (mg) = 1000 micrograms (mcg)</td>
</tr>
</tbody>
</table>

#### Weight Conversion

<table>
<thead>
<tr>
<th>Metric</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 kilogram (kg) = 2.2 pounds (lb)</td>
<td>1 pound (lb) = 16 ounces (oz)</td>
</tr>
</tbody>
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#### Volume for Solids

<table>
<thead>
<tr>
<th>Metric</th>
<th>Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1000 cubic decimeters (dm) = 1 cubic meter (m³)</td>
<td>1 liter (L) = 1000 milliliters (mL)</td>
</tr>
<tr>
<td>1000 cubic centimeters (cm³) = 1 cubic decimeter (dm³)</td>
<td>10 centiliters (cL) = 1 deciliter (dL)</td>
</tr>
<tr>
<td>1000 cubic millimeters (mm³) = 1 cubic centimeter (cm³ or cc)</td>
<td>10 deciliters (dL) = 1 liter (L)</td>
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</table>

#### Approximate Equivalents Among Systems

<table>
<thead>
<tr>
<th>Metric</th>
<th>Household/English</th>
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</thead>
<tbody>
<tr>
<td>240 milliliters (mL)</td>
<td>1 cup = 8 ounces (oz) = 16 tablespoons (tbsp)</td>
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<tr>
<td>30 milliliters (mL)</td>
<td>1 ounce (oz) = 2 tablespoons (tbsp) = 6 teaspoons (tsp)</td>
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<tr>
<td>15 milliliters (mL)</td>
<td>1 tablespoon (tbsp) = 3 teaspoons (tsp)</td>
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<tr>
<td>5 milliliters (mL)</td>
<td>1 teaspoon (tsp)</td>
</tr>
<tr>
<td>1 milliliter (mL)</td>
<td>15 drops (gtts)</td>
</tr>
<tr>
<td>0.0667 milliliters (mL)</td>
<td>1 drop (gtt)</td>
</tr>
<tr>
<td>1 meter (m)</td>
<td>39.4 inches (in)</td>
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<tr>
<td>2.54 centimeters (cm)</td>
<td>1 inch (in)</td>
</tr>
<tr>
<td>1 foot (ft) = 12 inches (in)</td>
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</tbody>
</table>

### Standard Deviation Formula for Sample Data

\[
\sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}
\]

### Body Surface Area

\[
BSA \ (m^2) = \sqrt{\frac{[\text{height} \ (cm) \times \text{weight} \ (kg)]}{3,600}}
\]

\[
BSA \ (m^2) = \sqrt{\frac{[\text{height} \ (in) \times \text{weight} \ (lb)]}{3,131}}
\]

### Formulas

### References


Event Summary
Medical Reading provides Secondary and Postsecondary/Collegiate members with the opportunity to improve their reading comprehension and understanding of special topics related to leadership development and the health community. This competitive event shall be a written test consisting of information and knowledge gained from reading the selected books each year. Competitors will apply, analyze, synthesize and/or evaluate the reading material in a multiple choice test plus one tie-breaker essay question. This event aims to inspire members to be proactive future health professionals and utilize the knowledge gained from reading medical and leadership books.

Dress Code
Competitors must be in official HOSA uniform or in proper business attire. Bonus points will be awarded for proper dress.

General Rules
1. Competitors in this event must be active members of HOSA-Future Health Professionals and in good standing in the division in which they are registered to compete (Secondary or Postsecondary/Collegiate).

2. Competitors must be familiar with and adhere to the “General Rules and Regulations of the HOSA Competitive Events Program (GRR).”

3. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitor’s photo ID must be presented prior to ALL competition rounds.

4. The books for the year will be selected by the HOSA Competitive Events program staff and will relate to Health Science Education curriculum competencies.

Official References
5. Secondary & Postsecondary/Collegiate competitors will read the following five books:
   - The Poisoner’s Handbook: Murder and the Birth of Forensic Medicine in Jazz Age New York by Deborah Blum
   - What Patients Say, What Doctors Hear by Danielle Ofri, MD
   - Chasing My Cure: A Doctor’s Race to Turn Hope into Action by David Fajgenbaum
   - Why We Get Sick: The Hidden Epidemic at the Root of Most Chronic Disease – and How to Fight It by Benjamin Bikman
   - Teen Leadership Revolution: How Ordinary Teens Become Extraordinary Leaders by Tom Thelen

The Test
6. The event is a 50-question, multiple-choice test (10 questions per book) and one (1) tie-breaker essay question

7. There will be a 60 minute time limit. No study lists will be provided.

HOSA Medical Reading Guidelines (August 2021)
8. **Test Instructions:** The competitors will be given instructions and will be notified to start the test. There will be a maximum of 60 minutes to complete the test. Competitors should leave the testing site promptly after submitting all testing materials and evaluations.

   **NOTE:** *Chartered associations/regions may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer.* Check with your Area/Region/State/Chartered Association for the process you will be using.

9. **TIME REMAINING ANNOUNCEMENTS:** There will be a verbal announcement when there are 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.

10. **Sample Test Questions** *(Samples are from a previous year)*

    **Radium Girls**

    1. The symptoms of radium poisoning are very similar to poisoning from which other chemical?
       A. Bromine
       B. Carbon
       C. Lead
       D. **Phosphorus**

       Page 21

    2. What was the nickname given to the girls who shined at night from the radium powder?
       A. **Ghost girls**
       B. Shimmering girls
       C. Radiant girls
       D. Lustrous girls

       Page 44

    3. How did Mollie Maggia die?
       A. Increased blood volume due to increased number of red cells
       B. **Hemorrhaging from the jugular vein**
       C. Bone necrosis and bone cancer
       D. Breast cancer with metastasis to the brain

       Page 39

**Final Scoring**

11. The competitor should write his/her answer to the tie-breaker essay question on the tie-breaker page of the test that remains attached to the original test.

12. Final rank is determined by the test score. In case of a tie, the essay question will be used to determine the rank.

**Competitors Must Provide:**
- Two #2 lead pencils with eraser
- Photo ID
Medical Spelling

New for 2021-2022
Reminder that the Taber’s Audio Glossary is an option for chartered associations and at ILC to use for the spelldowns.

Event Summary
Medical Spelling provides HOSA members with the opportunity to gain knowledge and skills regarding definitions and spelling of medical terms. This competitive event consists of two rounds. Round One is a written, multiple choice test and Round Two is a “spelldown” where competitors spell terms in front of judges. This event aims to inspire members to become skilled in medical spelling.

Dress Code
Competitors must be in official HOSA uniform or in proper business attire. Bonus points will be awarded for proper dress in Round One. Competitors who are not dressed appropriately for Round Two will not be allowed to compete.

General Rules
1. Competitors in this event must be active members of HOSA-Future Health Professionals and in good standing.
2. Secondary and Postsecondary/Collegiate divisions are eligible to compete in this event.
3. Competitors must be familiar with and adhere to the “General Rules and Regulations of the HOSA Competitive Events Program (GRR).”
4. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitor’s photo ID must be presented prior to ALL competition rounds.

Official References
5. The test items and the medical term lists shall be randomly selected from the standard reference. No study lists will be provided. The official reference for terms selected shall be:
   • Taber’s Audio Glossary, F.A. Davis Company, Latest edition.
Purchasing the dictionary will also give HOSA members access to the audio online glossary, which can be used by chartered associations/ILC for competition, and by competitors to practice.

Round One Test
6. Test Instructions: The written test will consist of 50 multiple choice items in a maximum of 60 minutes.
7. **TIME REMAINING ANNOUNCEMENTS:** There will be a verbal announcement when there are 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.

8. The test is only used to advance competitors to Round Two and may be used as a tiebreaker in the event of a tie during the spell down per rule #22.

**NOTE:** Chartered associations/regions may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Area/Region/State/Chartered Association for the process you will be using.

9. **Sample Test Questions**
   1. An obstructing infection in a renal pelvis or ureter
      A. Pilonefritis
      B. Pyonephrosis
      C. Pilonephritis
      D. Pyonefrosis
      Taber’s Page 1973

   2. A specialist in diseases of the nervous system
      A. Neuralogist
      B. Neologist
      C. Neurologist
      D. Nurologist
      Taber’s Page 1627

   3. The act of swallowing
      A. Deglutition
      B. Digluation
      C. Deglutation
      D. Diglutition
      Taber’s Page 631

**Round Two Speldown**

10. If the competitor is more than 5 minutes late to Round Two, the spelldown will begin without them and they may not be allowed to compete, in accordance with the GRR.

11. Based on the written test scores, Round Two competitors will be seated in ascending order (from lowest test score to highest test score) for the spell down. The spelldown begins with the competitor who had the lowest test score and is seated in chair #1.

12. The term list for the “spell down” will be arranged from easy to difficult.
   - Rounds 2 and 3, numbered 1 - 100 will be easy terms.
   - Rounds 4, 5 and 6, numbered 101 – 200, will be moderate terms.
   - Round 7 and beyond, numbered 201 – 300, will be difficult terms.

   An additional list of 100 very difficult terms will be available at the International Leadership Conference if all terms on the Round 7 & Beyond list are used before a winner is determined. This list will be numbered from 1 – 100.

13. **SELECT A WORD:** Round Two competitors shall draw numbers in turn and present it to the moderator, who announces the number. The number the competitor draws will correspond to a numbered term on the term list. As soon as the word is identified, the judges should quickly locate the word in their resource.
14. **PRONOUNCE THE WORD:** At ILC, Taber’s Audio Glossary will be used to pronounce each term for the competitor. Competitors can use the audio glossary listed in the event resources (item #5 above) to practice. Using the online glossary to pronounce each term will ensure everyone hears the same thing across all sections. The competitor may request to have the term re-pronounced by the Audio Glossary.

   * Note: Competitors should check with their State Advisor to determine if the Taber’s Audio Glossary will be used for any chartered association-level conferences.

   If chartered associations choose to use an in-person moderator to pronounce each term, instead of the Audio Glossary, it is acceptable for the moderator to confer with the judges before pronouncing a term for a competitor. When the word is pronounced by the moderator, if any of the judges would have pronounced the word differently he/she should announce “STOP”, and state “I would like to offer another pronunciation.” (or something similar), and then he/she should pronounce the word. If chartered associations use an in-person moderator to pronounce each term, the person should be as free from dialect as possible.

   **JUDGE TIP:** The best time to encourage the competitor to speak louder and clearer is when they pronounce the word, before they begin spelling. For example, it is fine for the judge to say “STOP. Would you please repeat your pronunciation of the word, and speak loudly and clearly as you spell the word. We want to be sure we hear exactly what you are spelling.”

15. **DEFINE THE WORD:** The competitor may also request a definition of the term. One judge or moderator should be designated to define the term upon request. If a competitor requests a definition, the designated judge or moderator should read the dictionary definition, or essential part of the definition, aloud for the competitor.

16. **COMPETITOR SPELLING RESPONSIBILITIES:** The competitor is to pronounce the term given to him/her and pause before starting to spell the word. This will give the moderator and judge(s) one opportunity to correct the competitor if the term was misunderstood. The competitor’s pronunciation will not have any bearing on the qualification or elimination of any competitor.

   a. The competitor will have 2 minutes to complete spelling the term. If the spelling has not been completed at the end of 2 minutes, the competitor will be eliminated. The time will begin at the first pronunciation by the moderator.

   b. No pencil or paper will be allowed in the speldown for the competitor.

   c. During the 2 minutes and before starting to spell the word, the competitor may ask for additional pronunciations from the Audio Glossary and may ask for another definition, but the clock will be running.

   d. Once spelling has begun, there will be no other opportunity for
e. Having started to spell the term, the competitor will be given one (1) opportunity to change letters.

f. If a medical term provided to the student contains a hyphen, the competitor will state "hyphen" at the appropriate place in the word. If the medical term is two words, the competitor will be required to state "space" at the appropriate place between words. Competitors will not be penalized if capitalizations are not included.

g. A warning will be given at 1 ½ minutes that 30 seconds remain.

h. The competitor **must** pronounce the term to declare that he/she has finished spelling.

i. If the competitor fails to pronounce the term prior to spelling or after spelling the term, he/she will be eliminated.

j. The moderator will **NOT** give the correct spelling for a term if the competitor spells the term incorrectly.

17. Judges will write down each letter as the competitor spells the term. If there are doubts about the spelling, judges will wait until after the spelling is completed and confer. If there is still confusion the determination may be made to have the competitor respell the word or select a new word.

**JUDGE TIP:** Be aware that sometimes there are two correct spellings for a single term. Multiple spellings will be included in the word listing the judges receive. For example:

- orthopedic and orthopaedic
- mammaplasty and mammoplasty
- malacoplakia and malakoplakia
- chakra and cakra

18. The next competitor will draw a new term to spell. In the event that all competitors are eliminated in a single round, all competitors will return to resume the spell down. If only one competitor spells correctly in a given round they will be determined the winner, those eliminated will return to a spell down to determine the remaining top ten.

19. Any question relating to the competition must be referred to the judges immediately. By raising his/her hand, the competitor will be recognized by the event personnel or judges. **The decision of the judges is final.**

20. When there are two remaining competitors, regardless of if the round is completed, the elimination procedure changes.
   a. As soon as one competitor misspells a term, the other competitor **immediately** shall be given the opportunity to spell the same term.
   b. If the second competitor spells the term correctly, he/she selects a new term.
   c. If the competitor then spells the new term correctly, he/she shall be declared the first-place winner.
d. However, if after correctly spelling the missed term, he/she misspells the new term, a new round will begin with both competitors spelling in the original order.

21. No microphones will be used during competition. NO OBSERVERS will be allowed during the event.

Final Scoring

22. If the final two spellers continue to go back and forth spelling words correctly – the following process may be used: When there are five minutes remaining in the event, the moderator will announce the remaining time. The length of time dedicated to the entire Medical Spelling event is determined by each chartered association and aligns to conference planning logistics. If the final spellers are still both “standing” at the end of the given time, the test scores will be used as the tiebreaker. The competitor with the highest test score will be declared the winner. If test scores are the same, the competitors with the highest test scores will be identified as co-winners. In the event this scenario takes place at a chartered association-level competition, most likely the chartered association would advance the co-winners plus the 3rd place finisher to ILC; however that decision is ultimately made on a case by case basis by the chartered association.

23. OPTIONAL FORMAT (To be determined by conference management): For Round Two, the Secondary (SS) competitors may be in the same room as the Postsecondary Collegiate (PSC) competitors. The PSC competitors would have their spelldown to determine the PSC order of finish, following the process in rules #10 – #21. At the conclusion of the PSC event, SS competitors would compete in Round Two. The words used by PSC competitors would NOT be repeated in the SS event. PSC competitors would have the option of leaving when their event is complete or staying to watch the SS spelldown.

Competitor Must Provide:
- Two #2 lead pencils with an eraser
- Photo ID

Spelldown Results Instructions

1. Competitors for Round Two should be posted in the order they will spell, beginning with the competitor qualified for Round Two with the lowest test score. The competitor with the highest test score from Round One will spell last.

2. Determine how many spellers are in Round Two, and cross out the places not needed on the Spelldown Results page below. (For example, if you have 25 spellers, cross out numbers 26-30.)

3. As soon as the first competitor misspells a word, his/her competitor number should be written in the last row on the Spelldown Results page. (If you have 25 spellers, write the number of the first competitor to misspell a word in row 25.)

4. Continue to fill in the results each time a competitor misspells a word.

5. The last remaining competitor’s ID number (winner) will be written in row #1 on the page.

6. Complete the Spelldown Results page information (competitor ID, name, school, chartered association) at the conclusion of the event.
## MEDICAL SPELLING
### SPELLDOWN RESULTS

<table>
<thead>
<tr>
<th>Final Place</th>
<th>Competitor ID</th>
<th>Name</th>
<th>School</th>
<th>Chartered Association</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st</td>
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Medical Terminology

New for 2021 - 2022
The ninth edition of Medical Terminology for the Health Professions by Ehrlich has been released.

Event Summary
Medical Terminology provides members with the opportunity to gain knowledge and skills regarding prefixes, suffixes, roots and anatomy, physiology, pathophysiology and occupations related to the health field. This competitive event consists of a written test and aims to inspire members to learn about terms common to health professions and health specialties.

Dress Code
Competitors must be in official HOSA uniform or in proper business attire. Bonus points will be awarded for proper dress.

General Rules
1. Competitors in this event must be active members of HOSA-Future Health Professionals and in good standing.

2. Secondary and Postsecondary/Collegiate divisions are eligible to compete in this event.

3. Competitors must be familiar with and adhere to the “General Rules and Regulations of the HOSA Competitive Events Program (GRR).”

4. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitor’s photo ID must be presented prior to ALL competition rounds.

Official References

Written Test
5. Test Instructions: The written test will consist of 100 multiple choice items in a maximum of 90 minutes.

6. Time Remaining Announcements: There will be a verbal announcement when there are 60 minutes, 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.

7. A series of twenty (20) tie-breaking questions will be administered with the original test for the Postsecondary/Collegiate division. In case of a tie, successive sets of
five tie-breaker questions will be used until a winner is determined. In the tie-breaker, correct spelling is required for an item to be considered correct.

8. **Test Plan:**

<table>
<thead>
<tr>
<th>Topic</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roots, prefixes, suffixes, and combining forms</td>
<td>45%</td>
</tr>
<tr>
<td>Overview of Body</td>
<td>5%</td>
</tr>
<tr>
<td>Skeletal</td>
<td>5%</td>
</tr>
<tr>
<td>Muscular</td>
<td>5%</td>
</tr>
<tr>
<td>Respiratory</td>
<td>5%</td>
</tr>
<tr>
<td>Digestive</td>
<td>5%</td>
</tr>
<tr>
<td>Cardiovascular &amp; Lymphatic</td>
<td>5%</td>
</tr>
<tr>
<td>Nervous/Special Senses</td>
<td>5%</td>
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<tr>
<td>Endocrine</td>
<td>5%</td>
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<tr>
<td>Reproductive</td>
<td>5%</td>
</tr>
<tr>
<td>Integumentary</td>
<td>5%</td>
</tr>
<tr>
<td>Urinary</td>
<td>5%</td>
</tr>
</tbody>
</table>

**NOTE:** Chartered associations/regions may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Area/Region/State/Chartered Association for the process you will be using.

9. **Sample Test Questions**

1. What is the study of the structure, composition and function of body tissues?
   - A. Biology
   - B. Cytology
   - C. Endocrinology
   - D. **Histology**
     
     Ehrlich Page 35/Dean Vaughn Page 110

2. What is the meaning of the term hysterectomy?
   - A. Cryosurgery of the ovaries
   - B. **Surgical removal of the uterus**
   - C. Rupture of the uterus
   - D. Suturing of the fallopian tubes
     
     Dean Vaughn Page 39/Stedman’s Page 615

3. Which suffix refers to breathing?
   - A. -cide
   - B. -ion
   - C. **-pnea**
   - D. -stasis
     
     Ehrlich Page 441

**Final Scoring**

10. Final rank is determined by the test score. In case of a tie, the tie-breaking questions will be used to determine the rank.

**Competitor Must Provide:**
- Two #2 lead pencil with eraser
- Photo ID
**Event Summary**

The Nutrition test provides HOSA members with the opportunity to explore and learn about the relationship of nutrition and wellness and to assess knowledge common in this health field. This competitive event consists of a written test with a tie-breaker essay question. This event aims to inspire members to be proactive future health professionals and to apply and analyze information related to nutrition and health.

**Dress Code**

Competitors must be in official HOSA uniform or proper business attire. Bonus points will be awarded for proper dress.

**General Rules**

1. Competitors in this event must be active members of HOSA-Future Health Professionals and in good standing.

2. Secondary and Postsecondary/Collegiate divisions are eligible to compete in this event.

3. Competitors must be familiar with and adhere to the “General Rules and Regulations of the HOSA Competitive Events Program (GRR).”

4. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitor’s photo ID must be presented prior to ALL competition rounds.

**Official References**


**Written Test**

5. **Test Instructions:** The written test will consist of 100 multiple choice items in a maximum of 90 minutes.

6. **Time Remaining Announcements:** There will be a verbal announcement when there are 60 minutes, 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.

7. One essay question will be administered with the original test. In case of a tie, the essay question will be judged and used to break the tie.

8. The test plan for Nutrition is:
   - Carbohydrates, fats and proteins 15%
   - Vitamins & minerals 15%
   - Water (Fluid & electrolyte balance) 10%
   - Nutrition through the life span 15%
   - Digestion, absorption and metabolism 10%
   - Cultural patterns and food habits 5%

New for 2021-2022

16th edition of Williams’ Basic Nutrition & Diet Therapy by Staci Nix has been released.
• Food related illnesses, intolerances, and allergies 10%
• Medical nutrition therapy 20%
  o Diabetes
  o Cardiovascular disease
  o Renal disease
  o Gastrointestinal disease
  o Cancer
  o Clients with special needs

**NOTE:** Chartered associations/regions may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Area/Region/State/Chartered Association for the process you will be using.

9. **Sample Test Questions**

1. Lactose, maltose and sucrose belong to which type of carbohydrate group?
   A. Disaccharides
   B. Liposaccharides
   C. Monosaccharides
   D. Polysaccharides
   Roth Page 66

2. Which body organ has no stored supply of glucose and requires a minute-to-minute supply from the blood?
   A. Heart
   B. Liver
   C. Brain
   D. Pancreas
   Nix Page 21

3. Diets high in cholesterol and saturated fats are thought to contribute to which condition?
   A. Diabetes mellitus
   B. Atherosclerosis
   C. Hypertension
   D. Macular degeneration
   Roth Page 244

**Final Scoring**

10. The competitor should write his/her answer to the tie-breaker essay question on the tie-breaker page of the test that remains attached to the original test.

11. Final rank is determined by the test score. In case of a tie, the essay question will be used to determine the rank.

**Competitor Must Provide:**
- Two #2 lead pencils with an eraser
- Photo ID
# Pathophysiology

## Event Summary

Pathophysiology provides members with the opportunity to gain knowledge and skills regarding pathophysiology concepts. This competitive event consists of a written test with a tie-breaker essay question. This event aims to inspire members to learn about the anatomy and physiology of human diseases impacting the health community.

## Dress Code

Competitors must be in official HOSA uniform or proper business attire. Bonus points will be awarded for proper dress.

## General Rules

1. Competitors in this event must be active members of HOSA-Future Health Professionals and in good standing.

2. Secondary and Postsecondary/Collegiate divisions are eligible to compete in this event.

3. Competitors must be familiar with and adhere to the "General Rules and Regulations of the HOSA Competitive Events Program (GRR)."

4. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitor’s photo ID must be presented prior to ALL competition rounds.

## Official References


## Written Test

5. **Test Instructions:** The written test will consist of 100 multiple choice items in a maximum of 90 minutes.

6. **Time Remaining Announcements:** There will be a verbal announcement when there are 60 minutes, 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.

7. One essay question will be administered with the original test. In case of a tie, the essay question will be judged and used to break the tie.

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**New for 2021-2022**

The 7th edition of Essentials of Human Diseases and Conditions by Frazier & Fuqua has been released. The test plan has been updated.
8. The test plan for Pathophysiology is:
   - Disease Process & Terminology (includes cancer & neoplasms) 12%
   - Body Systems
     - Integumentary 8%
     - Musculoskeletal 10%
     - Circulatory & Lymphatic 12%
     - Respiratory 8%
     - Digestive 12%
     - Endocrine 8%
     - Nervous & Senses 10%
     - Reproductive 6%
     - Urinary 6%
     - Mental Disorders 8%

NOTE: Chartered associations/regions may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Area/Region/State/Chartered Association for the process you will be using.

9. Sample Test Questions
   1. The primary cause of osteomalacia is a deficiency or ineffective use of which nutrient?
      A. Calcium
      B. Vitamin A
      C. Iodine
      D. Vitamin D
      Frazier Page 265
   2. Which type of shock is caused by a severe allergic reaction?
      A. Anaphylactic
      B. Cardiogenic
      C. Hypovolemic
      D. Neurogenic
      Zelman Page 107
   3. What neurotransmitter is produced in insufficient quantities in a patient with Parkinson’s disease?
      A. Aldosterone
      B. Dopamine
      C. Gamma globulin
      D. Prednisone
      Frazier Page 560

Final Scoring

10. The competitor should write his/her answer to the tie-breaker essay question on the tie-breaker page of the test that remains attached to the original test.

11. Final rank is determined by the test score. In case of a tie, the essay question will be used to determine the rank.

Competitor Must Provide:
- Two #2 lead pencils with an eraser
- Photo ID
Pharmacology

New for 2021-2022
Fulcher text has been retired. The Pharmacy Technician: A Comprehensive Approach by Moini has been added.
Rounding has been clarified.

Event Summary
Pharmacology provides HOSA members with the opportunity to gain knowledge and skills regarding the area of healthcare concerned with uses, effects, and modes of actions of drugs. This competitive event consists of a written test with a tie-breaker essay question. This event aims to inspire members to learn about how drugs work in the body, proper administration, and adaptations for different patients and conditions.

Sponsorship
This competitive event is sponsored by CVS Health

Dress Code
Competitors must be in official HOSA uniform or proper business attire. Bonus points will be awarded for proper dress.

General Rules
1. Competitors in this event must be active members of HOSA-Future Health Professionals, in good standing.
2. Secondary and Postsecondary/Collegiate divisions are eligible to compete in this event.
3. Competitors must be familiar with and adhere to the "General Rules and Regulations of the HOSA Competitive Events Program (GRR)."
4. All competitors shall report to the site of the event at the time designated for each round of competition. At ILC, competitor’s photo ID must be presented prior to ALL competition rounds.

Official References

Written Test
5. Test Instructions: The written test will consist of 100 multiple choice items in a maximum of 90 minutes.
6. Time Remaining Announcements: There will be a verbal announcement when there are 60 minutes, 30 minutes, 15 minutes, 5 minutes, and 1 minute remaining to complete the test.
7. One essay question will be administered with the original test. In case of a tie, the essay question will be judged and used to break the tie.
8. The test plan for Pharmacology is:
Safety will be integrated throughout the test plan
- Basic Concepts in Pharmacology 12%
- Career Opportunities in Pharmacology 3%
- Ethical and Legal Responsibilities 10%
- Pediatrics and Geriatrics Adaptations 10%
- Drug Names, Classifications, Action, and Interactions 30%
- Drug Administration 20%
- Drug Measurement, Dosage, Conversions 10%
- Technologies in Pharmacology 5%

NOTE: Chartered associations/regions may use a different process for testing, to include but not limited to pre-conference testing, online testing, and testing at a computer. Check with your Area/Region/State/Chartered Association for the process you will be using.

9. At the International Leadership Conference, HOSA will provide basic handheld calculators (no graphing calculators) for addition, subtraction, division, multiplication and square root.

10. All competitors will receive two 8.5x11” sheets of blank paper for use during testing

11. Rounding: Converting between measurement systems will often render a different answer depending upon which systems and conversions are being used. The answer to a calculation problem will ultimately be the same answer after appropriate rounding. When determining a solution, round only the final answer after all calculation steps have been completed.

When rounding decimal numbers to the nearest tenths, hundredths, or thousandths, look to the immediate right of the digit located in the position to be rounded. If the number to the direct right is 5 or larger, round to the position up one number and drop everything that follows. If the number to the direct right is 4 or smaller, leave the position being rounded as is and drop everything that follows. In specific situations, answers will be rounded per medical protocol. For example, pediatric dosage is always rounded DOWN to avoid potential overdose. Unless otherwise indicated, all answers should be rounded to the nearest whole number. (Examples: 31.249 (rounded down) = 31 and 23.75 (rounded up) = 24).

12. Sample Test Questions

1. What U.S. federal legislation established financial incentives for the development and marketing of drugs for the treatment of rare diseases?
   A. Amendment to Applications for FDA Approval to Market New Drug
   B. Drug Regulation and Reform Act of 1978
   C. Omnibus Budget Reconciliation Act
   D. Orphan Drug Act of 1983

2. A client who has been taking salicylates for a long period of time should be watched closely for which of the following adverse reactions?
   A. GI bleeding
   B. Fever of undetermined origin
   C. Hypotension
   D. Diminished urinary output
3. Dramamine 25 mg po is ordered for nausea and vomiting. The bottle is labeled 5 mg/4 mL. How many mL will be given per dose?
   A. 16 mL
   B. 20 mL
   C. 40 mL
   D. 50 mL

   Moini Pages 164-169

   Solution
   
   \[\frac{5 \text{ mg}}{4 \text{ mL}} = 1.25 \text{ mg/mL}\]
   
   \[25 \text{ mg/dose} \times \frac{1 \text{ mL}}{1.25 \text{ mg}} = 20 \text{ mL/dose}\]

Final Scoring

13. The competitor should write his/her answer to the tie-breaker essay question on the tie-breaker page of the test that remains attached to the original test.

14. Final rank is determined by the test score. In case of a tie, the essay question will be used to determine the rank.

Competitor Must Provide:
- Two #2 lead pencils with an eraser
- Photo ID