



Curriculum Integration Guide

INTRODUCTION

Traditional learning outcomes are based on the memorization and understanding of teachings however, competency-based learning focuses on a deeper understanding of skills and concepts through application. Advancements in technology are rapidly changing medical education; Virtual simulations are now an essential tool.

CyberPatient (CP) is a pedagogically sound, competency-based learning platform built to enhance healthcare education. In a real-world clinical environment, all 4 Stages of Learning for Competency (Chan,1981) are present; Introduction, Coaching, Fine-tuning, and Mastery. CyberPatient's virtual clinical environment provides the base for the first 3 stages of learning and application of skills, preparing students for the 4th stage in the independent medical world. Competency-based education using CP also creates an inclusive and diverse environment where all learners feel safe, respected, and given an equal chance to succeed.

Experiential learning is the process of learning through experience and is more narrowly defined as “learning by doing.” CP is an experiential learning tool designed to enhance compiled thinking and recall recognition, using visual, audio, tactile, and written memory in a safe virtual environment.

This brief manual contains information about CyberPatient and how to integrate the platform into a healthcare curriculum/program.

***Note** - Every institution has a unique curriculum design, therefore requiring a customized integration of CP. Our team will work to ensure CP's curriculum integration supports your educational program's content, delivery, and assessment methodology.*

These high-level points provide the foundation to utilize CP before applying it to a curriculum:

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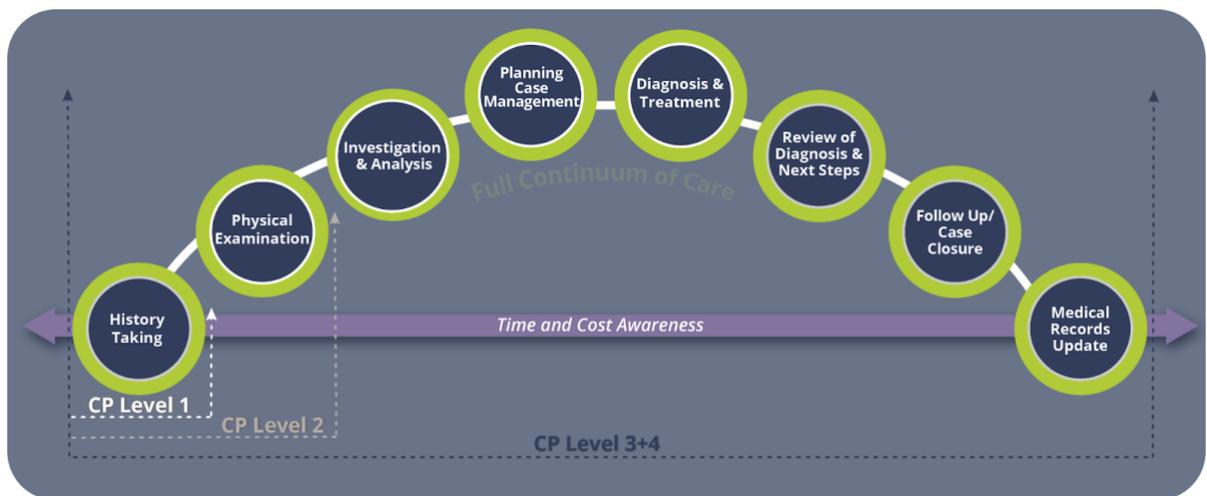
1) What is CyberPatient?

CyberPatient (CP) is a safe and diverse training hospital available 24/7. Students practice multiple clinical skills on 130+ virtual patients presented in peer-reviewed, inpatient, and outpatient cases. As an online interactive education platform, CyberPatient was designed by faculty for faculty to support medical and healthcare education across the globe. CP is the ultimate tool to support students, build confidence and enhance the development of clinical competencies and accurate decision-making skills. We bridge the gap between theory and practice. It is a textbook come to life!

2) How easily can CyberPatient be integrated into my curriculum?

This is one of the most asked questions received by faculty members using CyberPatient. The simple answer is - easily! Especially after understanding how CyberPatient's pedagogically sound concept and functionality can support any new/existing curriculum or medical/healthcare school's programs. It is scalable to all levels of the healthcare education journey, from pre-clinical to internship and beyond.

3) Curriculum integration and supporting the medical learning journey



Level One - History Taking

Skillset: Novice, pre-clerkship

Learning Objectives: (To achieve the learning objectives, CyberPatient recommends a minimum score of 80%.)

- Develop a logical approach to patient-presented problems while actively using didactic reasoning to analyze the information received from the patient and improve history-taking skills.

Note - Categories are aligned with the latest edition of the [Bates textbook](#).

Actions:

- Students navigate through categories by asking relevant questions.
- Advanced students may search for their questions directly in the search bar.
- Cases are completed by writing their findings in the patient chart.



CURRICULUM INTEGRATION – Level One:

- **Novice (Pre-clinical)** - CP can be used for Problem based Learning (PBL) or Case-Based Learning (CBL). CP replaces paper cases and provides a variety of online cases that faculty members can share in a classroom environment with their students.
- **Pre-clerkship** - Through history taking, students learn one of the first technical skills taught in medical school. By interviewing a patient and evaluating the interview in a didactic reasoning fashion, students make hypotheses leading to a potential patient condition. Through Level 1, students will practice with a very low-cost simulated patient that will never get tired and is available 24/7. Students can master their history-taking skills before they talk to a Standardized Patient or a real patient. CP Level 1 sharpens clinical skills; therefore, it can be the first implementation point in your curriculum/program. Research evidence exists to support this claim (1).
- The integrated intelligent tutoring system assesses student progress and presents the base for faculty to provide multiple formative assessments and guidance. *See Section 4 for more information.*

Level Two - History Taking and Physical Examination

Skillset: Novice, pre-clerkship

Learning Objectives: *(To achieve the learning objectives, CyberPatient recommends a minimum score of 80%.)*

- Develop an understanding of a general physical examination and special physical examination tests. Students practice logical approaches to connecting information received from patients' history taking with a physical examination and determining a list of hypotheses (provisional diagnosis).

Actions:

- Students perform general exams to receive information about the vital signs, general appearance, and other health parameters related to the patient. Students perform common methods of examination such as observation, superficial and deep palpation, percussion, and auscultation.
- Students then proceed to special physical examination tests. These short, animated videos demonstrate how exams are performed and receive feedback for positive or negative signs.
- Cases are completed by writing their findings in the patient chart.

CURRICULUM INTEGRATION – Level Two:

- **Novice (Pre-clinical) & Pre-clerkship** - Physical Examination serves as the second point of integration into any curriculum. The most important part of this section is the opportunity for students to develop logical thinking by connecting the information taken from the patient history with the physical examination. The system also has a digital chart where they learn how to document their findings and describe the rationale for the series of hypotheses, which is also called provisional diagnosis. Research evidence exists to support this claim (2).
- The integrated intelligent tutoring system assesses student progress and presents the base for faculty to provide multiple formative assessments and guidance. *See Section 4 for more information.*



Additional information about Physical Examination using CyberPatient

The platform allows for all physical examinations listed in the latest edition of Bates' textbook. Special examinations can also be reached by typing the name of the physical examination in the search box. During this level, students are encouraged to form a list of hypotheses and document their findings and rationale in the digital patient chart provided.

Level Three - Full Continuum of Care

Skillset: Intermediate, clerkship

Learning Objectives: (To achieve the learning objectives, CyberPatient recommends a minimum score of 80%)

- Level 3 allows students to practice logical approaches to the full continuum of patient care from history taking, physical examination to final diagnosis, and patient record documentation.

Actions:

- Students order lab tests, images, consultations, etc. from an exhaustive list of laboratory tests and imaging. This leads to differentials and identifying the final diagnosis.
- Students treat the patient from a database of over 5,000 medications, fluids, and other supplies. Students prescribe treatment based on the medication, dose, rate, and duration.
- Students make management/clinical decisions on how to proceed with the patient during each step. This includes; where the patient should stay, what kind of drugs, fluids, procedures, surgery, consultations, managing the daily diet, oxygenation, monitoring vital signs, input, output, and more.
- Make a final diagnosis and determine a follow-up plan to complete the case, followed by entering proper documentation into the patient chart, including a discharge summary.

3 Mistake Rule:

- The CP platform is based on a three-mistake rule where the *Integrated Intelligent Tutoring System (IITS)* provides immediate feedback highlighting the mistakes, however, the student moves forward to the next stage of the case.

CURRICULUM INTEGRATION – Level Three:

- **Clerkship** - Third and Fourth years of medical school usually include clerkship. Some common themes are listed above in the learning objectives. Level 3 supports students through their practice of system/specialty-based cases in the continuum of care. Students and faculty analyze the performance results, and faculty administers verbal or written feedback.
- As an assessment tool, Level 3 can be used in prerequisite examinations situations. *See Section 4 for more information.*

Level Four - Full Continuum of Care

Skillset: Internship and Advanced Clerkship

Learning Objectives: (To achieve the learning objectives, CyberPatient recommends a minimum score of 80%.)

Apply all practical knowledge stated from Levels 1, 2 & 3 into clinical practice. Learn to diagnose and treatment of CP, with minimal errors. Be ready for supervised independent practice such as an internship or residency training program.

Actions:

- Level Four follows the same actions as Level 3.

Advanced 3 Mistake Rule:

- In Level 4, after three mistakes, the system requires the student to restart the case. This increases the level of seriousness for the medical errors and better informs the instructors on the readiness of the student to perform the supervised or unsupervised independent practice.



CURRICULUM INTEGRATION – Level Four:

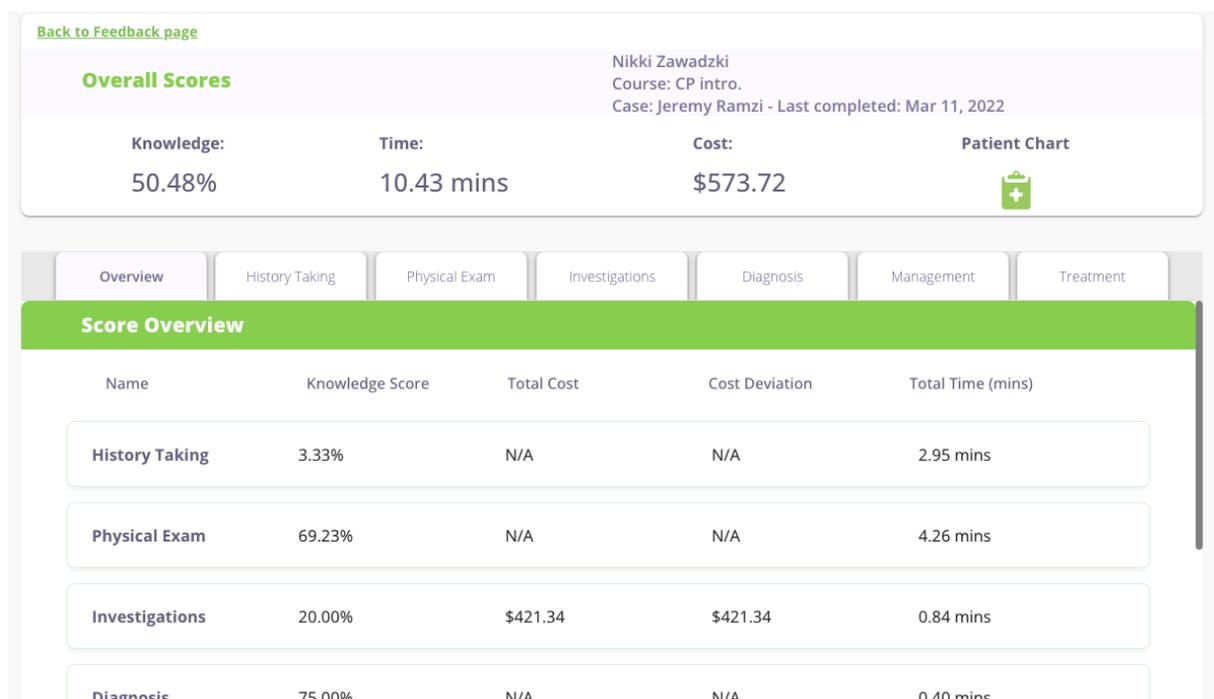
- **Internship** - The main objective of the internship program is to prepare and enable graduate students to function independently in a supervised clinical setting. Students should move from elaborated thinking (based on didactic reasoning), to compiled thinking (based on recall recognition memory). Achieving this requires the students' repeated use of specific pathologies to gain experience for independent clinical judgments.
- As an assessment tool, Level 4 can be used in prerequisite examinations situations. Additionally, this level can be used as an assessment tool for readiness prior to standardized patient modules and OSCE exams. *See Section 4 for more information.*

4) CyberPatient as an Assessment Tool

CyberPatient offers faculty and institutions multiple ways to assess and monitor the progress of individual students as they navigate through each section of the platform.

Integrated Intelligent Tutoring System (IITS): CyberPatient's Integrated Intelligent Tutoring and Scoring System continuously evaluates the student's decision-making skills and provides immediate feedback. At the end of a case, a student's progress is automatically generated based on three indicators: knowledge score, time on the platform, and cost of care. The indicators are also broken down into each stage of the case. This detailed level of documentation allows:

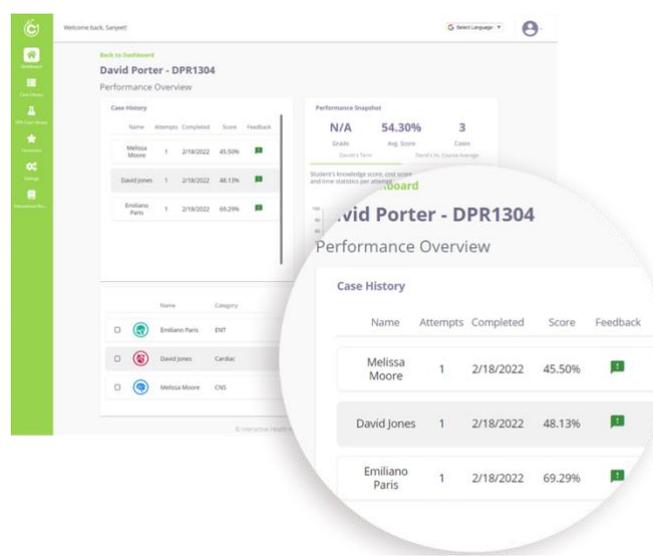
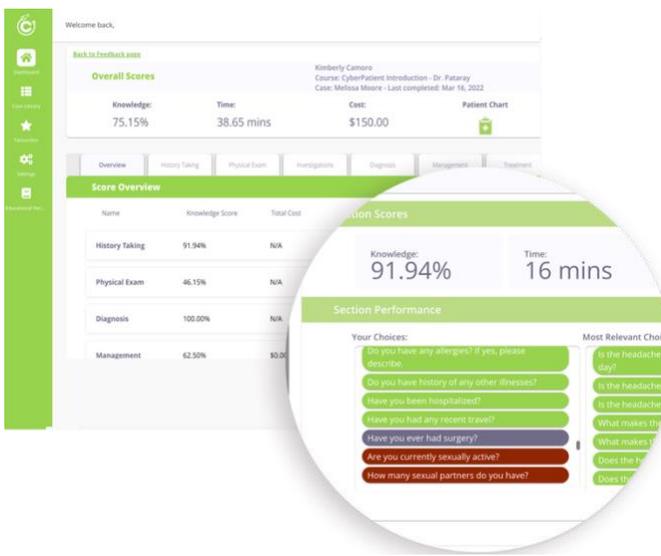
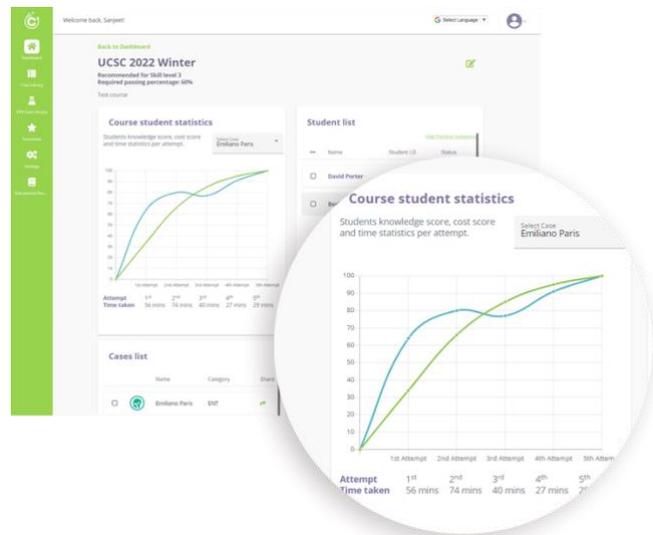
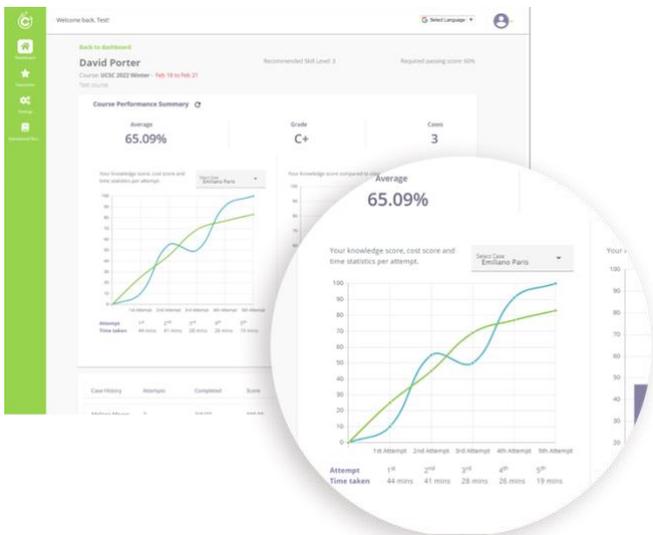
- Students easily identify their personal strengths and weaknesses, giving them an equal chance for success.
- Professors, at a quick glance, pinpoint areas for improvement and provide personalized support.



CyberPatient Score Dashboard (IITS)

Formative assessment: CP supports continuous formative assessment through detailed documentation of performance displayed on the student dashboard. CP gives faculty the resources to perform formative assessments whenever and as frequently as desired.

- Faculty can evaluate through the score dashboard (IITS). At a quick glance, faculty can pinpoint the student's weaker areas needing support as the score indicators are broken up in each section. Faculty can quickly provide this support by communicating directly with the student on the platform by giving further instructions and adding additional resources for reference.
- Students are encouraged to fill in the **Digital Patient Chart** as they progress through the cases. Faculty have access to the documentation and can easily evaluate student reasoning.
- As a result, CP reduces the faculty load and allows the faculty to focus on the quality of education. Compiling student knowledge can be timeous for faculty, however, CP alleviates this “bottleneck” by allowing faculty to provide efficient and continuous formative assessment.
- All communications, assessments, and scoring are recorded without prejudice providing total transparency in the student/faculty relationship.



Summative Assessment: The CP platform easily administers summative assessments at the end of a course period. Provided as a default assessment, each student is evaluated based on four criteria valued at 25% each. However, the summative assessment can be fully customized by the faculty/institution to suit the criteria set by the institution as outlined in the curriculum. Once the summative assessment is complete, a fully customizable completion certificate is generated per student; this can also be incorporated into any Learning Management System.

Summary of Performance

Review the student's performance below in order to complete a final assessment on overall course performance

Summative Assessment

Assessment of the student using CyberPatient during a semester or in a clinical rotation. Check all that apply

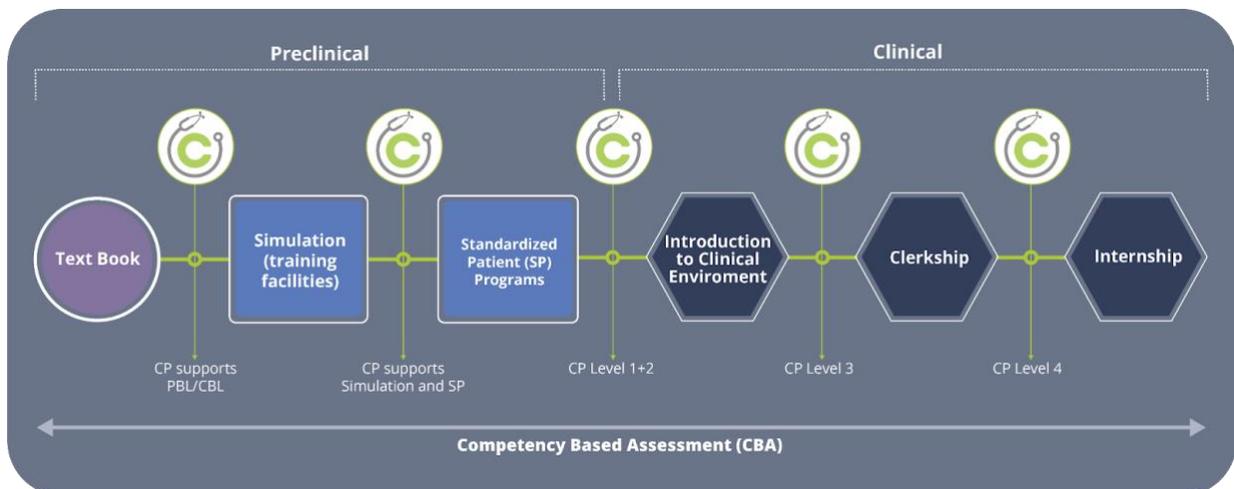
- The student completed all their CP assignments.
- Student responded to feedback and worked to improve clinical skills, clinical reasoning and critical thinking
- Student reached the designated level of the performance.
- Student had a good overall attitude toward the online education process and virtual learning environment.

Pass or Fail	Score
<input checked="" type="radio"/> Pass <input type="radio"/> Fail <input checked="" type="checkbox"/>	50.00%

Great job Lucy!

CyberPatient Default Summative Assessment Criteria

Examination Prerequisite, Standardized Patient Programs and OSCE Examination: CP serves as an ideal tool for the commonly used prerequisite assessments for clinical courses, rotation, end of the semester, and education cycles or exams. Faculty or the University determines the rate of the requirement for promotion (recommended anywhere from 70–100%). As a prerequisite to clinical exams, documentation of findings and results of a patient investigation are requested through coursework (patient charts). With CP, the faculty gathers important information about student performance based on assignments, coursework, and achievement of the learning objectives before attending the examination.



5) CyberPatient Benefits

The educational value of CP is high, especially with its guiding principles of competency-based learning and experiential learning. To further maximize CP's potential, please refer to the considerations below:

Benefits to Students

- Better clinical decision-making with increased accuracy.
- Students practice their clinical skills on CyberPatient and equip themselves with the skills needed to treat real patients anytime, anyplace, and as often as they like.
- Experience the first three stages of competency with different outcomes and the consequences of those decisions virtually without patient involvement.
- Builds their full spectrum of competencies to enter clinical practice and improve the efficiency of the learning process.
- Expedites the learning process to build recall recognition memory (compiled thinking).
- Practice documenting competencies without the pressure of a real clinical environment.
- Provides flexibility for all types of students, no matter their style of learning or confidence levels. Novice and weaker students gain confidence and practice clinical skills before dealing with a real patient.
- Increases understanding of specific growth areas through personalized and transparent formative assessments.

Benefits to Faculty

- CyberPatient supports faculty to support students in the development and verification of medical competencies without safety, ethical and legal issues before entering clinical practice.
- Provides flexibility for faculty to assign and deliver the learning objectives attached to each patient case and skill level.
- Reduces the stress of finding patients to deliver learning objectives for a specific rotation.
- Reduces faculty load while improving efficiency when monitoring student progress and administering more frequent and personalized formative assessments.

Benefits to Education Institution

- Increases the quality of medical education and subsequently the reputation of the education organization
- Substantially reduces the cost of medical education ([Paper](#)) (1).
- Using a modern technology tool, institutions can attract the interest of students and increase the number of applicants to the organization.
- Helps to sustain unity and consistency in the global medical education system through CP's easy methods of establishing learning objectives and success factors.

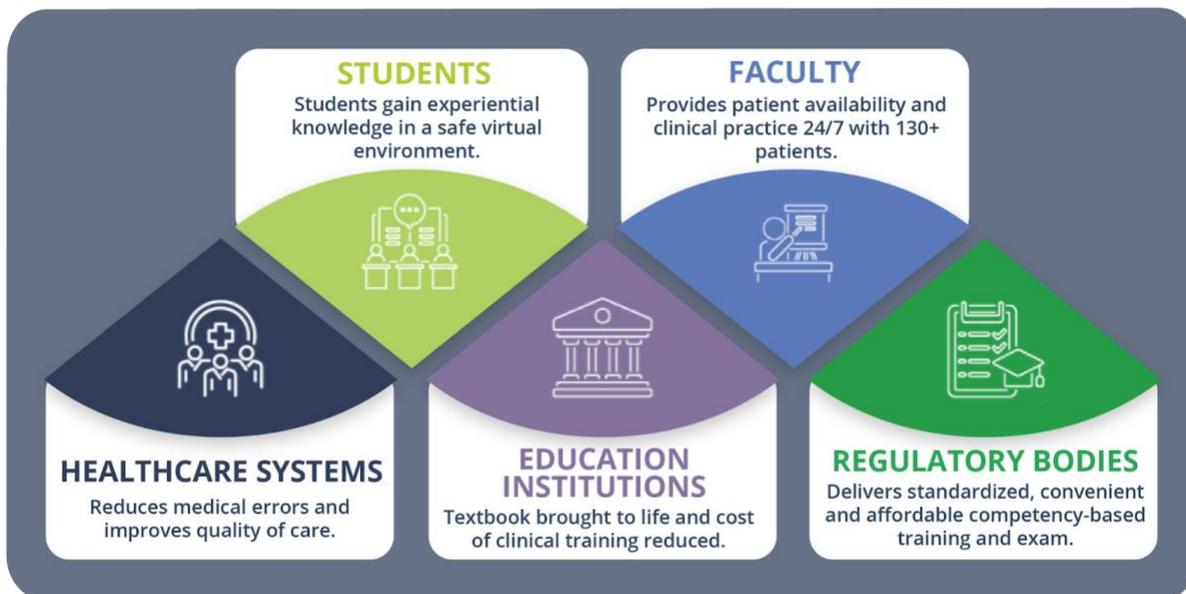
Benefits to the Healthcare system

- Highlights and manages the cost of care - Tracking and measuring the financial impact of patient care in CyberPatient teaches doctors to better manage the decisions impacting the cost of care for hospitals.
- Reduces medical errors saving costs for hospitals and medical systems across the globe.
- Helps prepare students to become better professionals that support the healthcare system more efficiently.

Benefits to Patients and Society

- Improves patient safety - Higher accuracy in clinical decision-making means improved care and safety for the patient.
- Risk reduction in the healthcare system will have a direct benefit to society.





6) Platform Considerations

- **CP is a gamified educational tool** - CP is a gamified digital platform supporting specific learning objectives related to clinical education and is scalable to the level of the student and their educational program.
- **Experiential Learning** - 'Learning by doing'
- **Stepwise progression** - The most effective student experiences using CP follow a methodical use; from simple to more complex. CP is designed for users with some prior knowledge of medicine. The platform yields ideal results when used in a stepwise progression from Level 1 (pre-clinical) to Level 4 (advanced clerkship).
- **Faculty support** - CP's integrated intuitive feedback system allows faculty to easily assess students' performance and optimize formative assessment. This tool makes evaluation efficient but still requires active participation by the faculty.
- **CP as a self-directed study tool** - CP can be used as a self-directed study, practice/ and self-assessment tool. However, CP is more effective when used as part of the school curriculum.

7) Technical Considerations

- For a seamless experience, please use **Google Chrome** browsers (best choice) or **Safari** (second choice) and ensure audio and video capabilities are enabled.
- CyberPatient is designed for **computers** and **iPads** only, at this time it is not effective on mobile phones.
- Some institutions and clinical settings have protective Firewalls against third-party software. Institutional IT teams would need to safe-list CyberPatient. CyberPatient can be used in an Incognito window if this is not possible.

8) Resources and References

Reference List

- Chan TW, Lin CC, Lin SJ, Kuo HC. OCTR: A Model of Learning Stages. *Proc. of 6th World Conference on Artificial Intelligence in Education'93*. 1993; 257-264.
- Kolb DA. *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice Hall; 1984.

Research Papers

- CyberPatient™ - An Innovative Approach to Medical Education – [review paper](#).
- Comparison of computer-assisted instruction (CAI) versus traditional textbook methods for training in abdominal examination (Japanese experience) – [review paper](#).
- Kazan State Medical University Survey after the Use of CyberPatient™ during COVID-19 – [review paper](#).
- Medical students in Russia evaluate the training during the COVID-19 pandemic - [review paper](#).
- Teaching Clinical Decision-Making Skills to Undergraduate Nursing Students via Web-based Virtual Patients during the COVID-19 Pandemic: A New Approach to The CyberPatient™ Simulator – [review paper](#).





Please consult the [CyberPatient HelpHub](#) for all queries you may have.



Cost Analysis

1. Why do I see a \$ amount attached to my case?

The dollar amount shown does NOT have any commercial or monetary value and is solely for **COST AWARENESS**. The system automatically tallies a general cost for each case's time, tests, and inaccuracies. Therefore, the amount shown is NOT an exact amount but close to the real-life cost associated with the case and the patient. The cost analysis highlights how mismanagement of a patient could drive up costs with associated effects the patient, clinical facility, and the healthcare system may incur.



Gold Standard Patient Management

2. What is the platform's patient management based on?

CyberPatient uses North American and Canadian Gold Standards clinical guidelines as a basis for the automatic feedback and grading system. However, we are aware of alternative clinical guidelines that countries, healthcare systems, or hospitals may have. Therefore, we made the system as flexible as possible to accommodate. Users can send suggestions to info@cyberpatient.ca for consideration.



Prescribing Medications

3. Why can I only see some medications and not other options like generic or different names?

CyberPatient used Gold Standard options for medications. However, we are aware of alternative medicines. Please reach out to our team with alternative suggestions; info@cyberpatient.ca for consideration.

For more FAQ's visit:

www.cyberpatient.ca/faq