I. COURSE DESCRIPTION

OVERVIEW: The purpose of this course is to enable MD-MBA students to frame and analyze health care management issues, to assess the managerial skills needed to manage a health care organization, and to prepare students for a variety of careers in the health care industry. Although students are introduced to the medical care production process and the service delivery system, the focus is on management innovations that can control health care costs and/or improve services, strategies for organizations and delivery systems to serve the new consumers and customers, and the uncertainties facing organizations that develop scientific innovations in pharmaceutical, biotechnology, and information technology for health organizations.

The course has been designed to introduce students to the management theories, analytic concepts, tools and approaches to managing in health care. One objective will be to familiarize students with internal problems of managing health organizations as delivery systems from the perspective of the “service” manager. There will be a strong emphasis on how corporate strategy, organizational structures, physician clinical decision-making, and internal management control systems affect organizational performance. Another objective is to teach students to think strategically about opportunities in a “health policy context.” In order to study health care management, students should be prepared to integrate the management concepts and tools across traditional functional areas (operations, organization behavior, marketing, strategy, accounting, and so on).
Health Care Management Program Outcomes:

**Core 1. Mobilizing and Developing Capabilities**
Students will acquire the tools and frameworks to mobilize and develop the capabilities of diverse staff, clients and other stakeholders who contribute to the organization’s mission.

**Core 2. Integrative Skills**
Students will be able to integrate tools, frameworks, and evidence from multiple disciplines in order to innovate and solve management problems.

The following course outcomes map to the program outcomes mentioned above.

**Course Outcomes (CO):**
- **CO1:** Employ and assess the tools of strategic thinking and organizational analysis to diagnose problems facing health care markets and organizations
- **CO2:** Examine the difference between corporate, competitive and operating strategies in health care and understand how strategic misalignments among levels of strategy influence organizational performance
- **CO3:** Apply managerial concepts and tools such as strategic service visions, Blue Ocean, lean thinking, front versus back stage, patient flow, and frontier methodology, to identify and fix misalignments in clinical operations and organizational design
- **CO4:** Assess and evaluate overall organizational performance such as access, financial performance and efficiency, and clinical quality such as technical outcomes, safety, and patient experience.
- **CO5:** Deconstruct the design variables and conditions that create high performing, integrated health care teams
- **CO6:** Observe and characterize the impact of leadership and culture on patient care (as well as individual, team, and organizational engagement and performance)
- **CO6:** Evaluate “strategic” factors in the health care environment and the potential “fit” of new health care models such as accountable care, medical homes, and value innovation

To achieve the course objectives, the course will focus on three areas:

- Learning the strategic lessons of health care organizations
- Learning to design, organize and manage health care operations and professionals
- Learning to manage strategic innovation and change in traditional health care organizations and new models of care—medical homes, accountable care organizations.

**II. AUDIENCE**
This course is designed to help you as MD-MBAs with your career and research interests aimed at a wide variety of industries and organizations: (1) Health Care Delivery Systems, (such as HMOs, hospitals, nursing homes, physician and dental practices, and other health services providers); (2) Health Care Supplier Industries, (such as pharmaceutical, medical device, medical
supply, and bio-technology industries); (3) Third party payors and Insurers, (such insurance companies, sickness funds, government agencies); (4) Government Agencies, (such as planning and regulatory agencies and social welfare agencies); (5) Financial Services such as venture capital, investment banking, and commercial banking; and (6) Non-Profit Human Service Organizations.

III. COURSE PREREQUISITES--NONE

IV. ORGANIZATION
A. Content: In this course we will use a mixture of readings (from journal articles and books) and business cases. The cases will be used to illustrate the concepts and premises of management theory, the values they represent, and their application in health care situations.

B. Structure: The class meets for 13 sessions around a variety of topics. Normally the first 100-120 minutes of each session will be lecture/case discussion, and the remaining time will be wrap-up or presentations. All required readings and cases should be completed before the class in which they will be discussed. Students can expect to be called upon to present aspects of the case being discussed. When student briefs are assigned to a team, teams can take the lead.

V. COURSE REQUIREMENTS AND GRADING
A. Participation. Attending all sessions, constructive participation in class*, quizzes, and comments on book summaries and case briefs, on-line polls, and posted after-class reflections 50%

B. Team Midterm (Analysis of Lean, February 7) 25%
   Group Exam on Schon Klinik (February 14)

C. Team score and Posted Team Reflection on Mt. Everest (February 10) 5%

D. Medicine-Management Science Case & Presentation 20%

*Students should be prepared to discuss the cases in class February 15-17.

VI. COURSE REQUIREMENTS AND GRADING DETAILS
A. Class Participation 50% (see “Tips on Preparing Cases” on page 20)

The character of the course naturally lends itself to active exchange among participants. The most important preparation is to have read and studied the cases. In the classroom, the expectations are relatively simple: be well-prepared, arrive punctually to class, and actively participate. There are several ways in which the materials in this course help you to do this.

Short Introduction or overviews provide background on, and an introduction to, the session’s materials. Read first – these provide context
Study Questions guide you through each session’s content. Read second - these help you focus on what is most important.

Assignments & Required Readings (incl. cases and articles) provide the content for our class discussion. If time do he optional readings—

Read and study the cases – these provide content (you can’t participate in class discussions without them)

How do I get a high grade for class participation? Individual contribution consists of;

- Attending classes on time, coming prepared to listen and build on the ideas of others;
- Quality of individual comments in class discussions;
- Post your reflections (1 or 2 key take-aways) after every class and engage in after-class on-line discussion with at least 2-3 students
- On-time submission of online questionnaire/case polls;

Attending Class (In-class comments/contributions). There are many ways to participate, beyond showing-up, speaking, and not surfing the internet in class. Listening carefully to what your colleagues are saying in class and building on their ideas is critical. Listening for understanding is critical to good leadership. If you do not understand what your colleagues are saying, raise your hand, and ask them to clarify. Quality and clarity are more important than quantity – one insightful, concise comment that builds on the ideas of others and advances the learning could create more value than speaking five times in one session.

Missing class: Please note the only “excused” absences are those due to uncontrollable events (e.g. medical/family emergencies or critical personal events). Prioritizing your time is part of your Brandeis experience. If you decide it is in your best interest to miss or be late to class your professor won’t take it personally, but it may negatively affect your participation grade. Please notify your professor ahead of time if you will miss class.

Polls: The polls should be no more than 1,300 characters with spaces. Use word count. Polls will not be graded, but they will count towards your class participation. Be ready to defend your positions in class. They are due the evening before class. Submit via LATTE (for help ask Norma DeMattos - ndemat@brandeis.edu).

Form a team. By the end of the first class (Jan 30), students will self-select into groups of five people (exceptions will be considered on an individual basis).

Book summary due when book is due: Each group will be prepared to present a 10 minute executive summary and review of the books below. To get full credit the team should summarize the key concepts and tools for health care management and be prepared to make a short 10 minute class presentation of the following books:

- Blue Ocean Strategy (Kim & Mauborgne)
- Service is Front Stage (Teboul)
- Lean Hospitals (Grabban)
- One The Mend (Toussaint & Gerard)
VI. COURSE REQUIREMENTS AND GRADING (continued)

B. In-Class Exams: There will be an occasional quiz. In addition there is an in-class midterm worth 15% on Lean Hospitals on February 7 and a Group Exam worth 10% on the Schon Klinik (February 14).

C. Reflection on team-work February 9: After the simulation, each student will discuss their group’s experience with the Mt. Everest simulation and explains the implications for collaborative teams in health care. Please post this on latte Feb 10.

D. Case conference: Advancing the New Science of Medicine & Management Case & teaching note due February 15-17 (2-3 single-spaced pages). Given your medical school training, your prior clinical experience and especially your clinical rotations I want each of you to develop an original clinical case study that advances the new science of medicine and management. The clinical case example should take place in the clinical setting, and involve medical decision-making and clinical operations. I do not want a traditional case record, focused on a patient presentation, a differential diagnosis, etc, but a deeper description and analysis of the context and a micro-process that seems to work well or not work well, that opens a class discussion. The case can describe the context, a positive or negative outcome, and the medical and managerial mechanisms. You will be graded on your ability to connect medical science with management science. Here are some guidelines.

• Briefly describe the clinical event or incident, performance problem, patient situation, and the clinical team and/or managerial/leadership behavior. etc. (i.e., technology, flow problem, patient crisis, hiring/firing decision, strategic issue) or other health case management issue/problem. You can use the cases from the course and the course materials to help frame the problem. Be sure to explain the clinical-managerial challenge, the clinical practice, the organizational factors that might affect the micro-process, and the outcomes you would expect.

• Each student will present the problem in 2 minutes and lead a 10 minute class discussion on his or her case and will be expected to use the case to illustrate theories and concepts from the readings. To frame your case, topics may be selected from the subject matter on the syllabus. This case should represent new work from in a real-life setting you experienced, not a recycled case.

• The case study should be short (2-3 single-spaced pages) and on the day of the presentation should include a 2-4 slide powerpoint (problem, context, mechanisms, outcome or similar) and teaching note (1 page) to be handed in only to the instructors.

• The case will be graded based on its ability to generate a crisp, provocative and lively class discussion at the intersection of medicine and management. Although the papers will not be graded, the presentation will be given a grade.
VII. REQUIRED TEXTS


VIII. REQUIRED CASES (to be purchased from HBS) Link to cases below:

[http://cb.hbsp.harvard.edu/cbmp/access/58278683](http://cb.hbsp.harvard.edu/cbmp/access/58278683)

a. Commonwealth Care Alliance: Elderly and Disabled Care (HBS Case, Product #: 708502-PDF-ENG)

b. Steward Health Systems (HBS Case, Product #: 814-029-PDF-ENG)

c. Virginia Mason Medical Center (HBS Case, Product #: 606044-PDF-ENG)

d. Apollo Hospitals: Differentiation through Hospitality (HBS Case, Product #: IMB425-PDF-ENG)

e. Carroll University Hospital (HBS Case, Product#: TCG101-PDF-ENG)

f. Boston Children’s Hospital: Measuring Patient Costs (HBS Case, Product #112086-PDF-ENG)

g. Time Driven Activity Based Costing (HBS, Product #106068-PDF-ENG)

h. Schon Klinik: Measuring Cost and Value (HBS, Product #9-112-085)

i. Cleveland Clinic Growth Strategy 2014 ( HBS, Product #9-709-473)

j. CVS Health: Promoting Drug Adherence (HBS, Product # 515-010)

k. Leadership & Team Simulation: Everest (included in HBS Coursepack—link will be provided). Everyone must bring a laptop and purchase the simulation

l. Patients Like Me: An On-line Community of Patients (HBS, Product 9-511-093)
IX. **RECOMMENDED TEXTS:** These are very useful books for healthcare managers. Concepts from them are used in the class but there are no specific assignments from these texts in the course syllabus.


**Academic Integrity:** Academic integrity is central to the mission of educational excellence at Brandeis University. Each student is expected to turn in work completed independently, except when assignments specifically authorize collaborative effort. It is not acceptable to use the words or ideas of another person- be it a world-class philosopher or your lab partner - without proper acknowledgement of that source. This means that you must use footnotes and quotation marks to indicate the sources of any phrases, sentences, paragraphs or ideas found in published volumes, on the internet, or created by another student. Violations of university policies on academic integrity, described in Section 3 of Rights and Responsibilities, may result in failure in the course or on the assignment, and could end in suspension from the University. If you are in doubt about the instructions for any assignment in this course, you must ask for clarification.

**Notice:** If you have a documented disability on record at Brandeis University and require accommodations, please bring it to the instructor’s attention prior to the second meeting of the class. If you have any questions about this process, contact Ravi Lakshmikanthan, Interim Assistant Dean of Academic and Student Services at the Heller School at kanthan@brandeis.edu.
PART I. STRATEGIC LESSONS IN HEALTH CARE

Session 1
January 30

Topic and Assignment
I. Leadership Challenges: Diverse Collaborative Teams in Health Care Organizations

To get things started you will form into teams with 5 members. You will use these teams throughout the course. To break the ice together, we will do a simulation.

In the desert survival simulation, you have survived a plane crash with your group. You have 15 items from the crash that you must rank in order of importance to the group’s survival. Your challenge is to rank the items based on their importance. Your group must decide on a strategy. Information is incomplete and ambiguous. You have time pressure and uncertainty. Can you make an effective group decision?

This opening session differentiates the leader’s responsibility from the group’s responsibility. Regarding the design of teams, diverse, virtual groups can have talent, effort, and strategy problems. Leaders are responsible for designing and coaching groups to support high performance. Once tasks are assigned to a group, members are responsible for the rational and relational processes. The team needs to be sure that their strategic thinking results in high quality decisions that are accepted by the group. We will have a plenary session to identify the main insights, with a summary.

Read and Prepare: M&M Case
In-Class-M&M Skit

Session 2
January 31

Topic and Assignment
I. The Challenge of Managing Health Care Organizations

Questions:
a) Does good management matter?
b) What are the major opportunities to be explored in this course?

Video Case: Can Gerry Robinson Fix the NHS? (Part 1)

Prepare Case: Dr. Baggins and the Cardiac Catheterization Lab & Dr. Edmonds, Shore Medical Center, and the DaVinci Decision (Edney, Chilingerian & Chilingerian) 2016

Questions:
a) What are the pros and cons of purchasing this medical technology?
b) What lessons can we learn for other advanced medical technologies such as real-time MRI, dedicated robotic or laser surgery?
Session 3  
February 1

**Topic and Assignment**

II. Some Fundamentals of Healthcare Management: Markets, Consumers, Patients and Organizations

**Case 1: Carroll University Hospital (HBS Case, Product # TCG101-PDF-ENG) (hand-in)**

Questions:

a) What is the cost of treating pancreatitis, cardiac dysrhythmia, and liver cancer under each accounting system? Which is the most accurate cost system? Which one enables costs to be controlled?

b) What should Dr. Julian do?

**On-line POLL:** What is the cost of treating pancreatitis, cardiac dysrhythmia, and liver cancer under each accounting system?

**Case 2: CVS Health: Promoting Drug Adherence**

**Questions:**

1. What are the types of adherence?
2. Diagnose the adherence situation, the stakeholder’s interests, and clarify the problem.
3. What is the value of adherence to CVS? In dollars, for which ailments are the results of the PAB most attractive?
4. Tell me the value of adherence for each stakeholder per adherent enrollee
5. Evaluate the Pharmacy Advisor Program and improve it.

**On-line POLL:** In dollars, for which ailments are the results of the PAB most attractive? Tell me the value of adherence for each stakeholder, per adherent enrollee

**Required Reading:**

1) “The Discipline of Strategic Thinking in Health Care” by Chilingerian 2006
2) *How to Solve the Cost Crisis in Health Care* HBR 2011, Kaplan and Porter
3) “The Origins of DRGs in the United States” by Chilingerian
Session 4  Topic and Assignment
February 2  IV. Corporate and Competitive Strategy

Case: Steward Health Care System (HBS Case, Product #: 696062-PDF-ENG) and Financial Statements

Questions:
a) What is the strategy? Should they continue to be an ACO?
On-line Poll: Should they continue to be an ACO? Why or why not.

Focus Strategies in Health Care

Case: Finland's COXA Hospital
Questions:
a) What opportunity is being fulfilled?
b) What is the strategy?

Required Reading:
1) “Lessons in the Service Sector” by Heskett, HBR 87206
2) The Strategy that Will Fix Health Care, (2013) HBR by Porter

Session 5  Topic and Assignment
February 3  III. Traditional Strategy & Blue Ocean Strategic Thinking

Video Case: WIKIPEDIA (in-class case)
Questions:
a) How did Wikipedia overtake Britannica?
b) Analyze the environment & lessons learned

Case: Commonwealth Care Alliance: Elderly and Disabled Care (HBS Case, Product #: 708502-PDF-ENG)
Questions:
a) How does Commonwealth Care Alliance work? Is this a value-based service?
b) What is your analysis of the strategy?

Required Reading:
1) “Blue Ocean Strategy” Kim and Mauborgne (entire book)
2) “What is Strategy?” HBR by M. Porter
3) “Competitive Advantage” by M. Porter
Session 6  Topic and Assignment
February 6 III. Cost, Quality, and the Value of Health Services

Case: Boston Children’s Hospital: Measuring Patient Costs HBS case, Product 9-112-086)

Questions:

a) Using good strategic thinking, analyze the market and competitive forces faced by BCH.
b) Why should clinical department heads (Dr. Meara & Dr. Waters) want to develop accurate costs?
c) Calculate the costs and margins of the three office visits using RCC method and TDABC. Explain the differences.
d) Suppose DPOS dedicates the following resources to handle all office visits: 2.5 surgeons, 2 ambulatory service reps, 2 RNs, 1 clinical assistant. During the year, the office performance 4,400 Plagiocephaly visits, 2,200 Neoplasm visits, and 1,800 Craniosyntosis visits. Calculate the quantities and costs of used and unused capacity for the four types of personnel, and the total cost of unused capacity for the year. How can Dr. Meara reduce the cost of unused capacity?
e) Using excel, calculate the costs and margins of 3 different orthopedic casts using TDABC.
f) Compare TDABC costs and margins with the existing RVU system. What differences occur and why?
g) If you were medical director, should the two TDAC pilots be extended through the hospital or should senior hospital management just allow local initiatives to arise spontaneously, based on local physician interest?

On-line Poll Question:
- Estimate the RCC cost for a plagiocephaly visit
- Estimate the TDABC cost for a plagiocephaly visit
- Estimate the TDABC cost for a Petrie long leg cast visit.

II. Learning from Outliers: Redesigning Health Services for Quality and Efficiency

Efficiency & Quality: What are they? How do we measure and evaluate them?

Case: Friederike Bismark's Dilemma (A)

Questions:

a) Diagnose Friederike's problem.
b) What are her goals? What methods can she use?
Required Readings:
1. "Evaluating Clinical Performance in Healthcare Services with Data Envelopment Analysis DEA" by Chilingerian
2. The Hot Spotters: Can we lower medical costs by giving the neediest patients better care? January 24, 2011, Atul Gwande
3. Eisenberg, Chapters 1-4, 6 (Skim)

Optional Readings:
1. “Managing Physician Efficiency and Effectiveness” by Chilingerian and Sherman, Health Services Management research, Vol 3 No 1 March 1990
2. “Health Care Applications” by Chilingerian and Sherman, Chapter 17, From Hospitals to Physicians, From Productive Efficiency to Quality Frontiers

Session 7
February 7

Topic and Assignment
IV. The Value & Lean Revolution in Health Care: Lean & Mean

MIDTERM 1: Lean Hospitals (directions to be provided)

Case: Apollo Hospitals: Differentiation through Hospitality (HBS Case, Product # IMB425-PDF-ENG)

Questions:
a) Drawing on Teboul's Front and Back Stage, how would you carry out the service design challenge of improving hospital services? How important is hospitality? Suggest methodologies to reduce complaints.

Required Reading:
1) Time-Driven Activity-Based Costing, 2009 HBS (9-106-068)
2) Service is Front Stage by Teboul (entire)
3) “Who has Star Quality?” by Chilingerian

Cases: Virginia Mason Medical Center (HBS Case, Product #: 606044-PDF-ENG) & Apollo Hospitals: Differentiation through Hospitality

Required Reading:
1) Lean Hospitals by Grabban (entire)
Session 8  
February 8  
**Topic and Assignment**  
V. The Challenge of LEADING High Performance Collaborative Teams in Health Care Organizations

**In-class simulation:** Leadership & Team Simulation: Everest (included in HBS Coursepack—link will be provided). Everyone must bring a laptop and must purchase access to the simulation ($12.50).

*Check [here](#) to ensure your computer meets the technical specifications.

**Write a reflection paper on your team’s experience and the implication for collaboration in health care.**

Session 9  
February 9  
**Topic and Assignment**  
I. Becoming a Health Care Entrepreneur & Leader

**Masterclass Guest Speaker:** Dr. Steven Shaya, MD

Session 9  
February 9 & 10  
**Topic and Assignment**  
VI. Aligning Operating Strategy, Competitive Strategy, and Corporate Strategy

**Video:** Lucy and the Chocolates

**Case:** Managing a Combined Liver-Kidney Transplant in Leuven Medical Center (B)

Questions:

a) What is a care program?
b) What is needed to make care programs work? Who are the stakeholders?
c) Is there a bottleneck? What is the likelihood of a bottleneck?
d) What are the lessons for health care management?

**Video:** Time-Based Management

**Required Reading:**

1) “Hospitals Get Serious about Operations,” by Mango and Shapiro
2) “Assessing Waits in a Health Care Service Delivery Process” by Chick
3) “Hitting the Bottleneck” by Phipps
4) *Don’t Manage Waits, Manage Experiences* By Gabriel Bitran, Juan Carlos Ferrer, and Paolo Rocha eOlivira
5) Download: “Stress on the Ward”
PART III. LEADERSHIP & MANAGERIAL EXCELLENCE

**Session 10**  
**February 13**  
**Topic and Assignment**  
I. Designing an Accountable & High Performing Health Care Delivery System

**Masterclass Guest Speaker:** Dr. Michael Jellinek, CEO Lahey Community Network and former CEO of Newton-Wellesley Hospital, will lead the session with an in-class case assignment (please read the case – both A and B – before class).

**Case: Newton Wellesley (A) & (B)**

**Required Reading:**  
1) “Turning Doctors into Leaders” by Lee

**February 13**  
I. Becoming a Health Care Manager & Leader

**Case: Implementing an Advanced Surgery Program at a Tertiary Care Regional Medical Center: Leading Change and the Liabilities of Newness**

Questions:

a) What went right? What went wrong? Is the surgical team a real team?

**Required Reading:**  
1. “Leadership that Gets Results” by Goleman

**Session 11**  
**February 14**  
**Topic and Assignment**  
I. Becoming a Health Care Manager & Leader

**Group Exam 2:** Schon Klinik: Measuring Cost and Value  
(Directions to be provided)

**Required Readings:** *On the Mend* by Touissant (entire)

Questions:

a) Did Thedacare achieve patient-centered care?

b) What are your insights from reading about Dr. Toussaint’s work at Thedacare. What underlies operational excellence?

C) What is the role of managers and leadership?
Session 12  
Topic and Assignment  
I. The New Science of Medicine and Management

MD-MBA CASE CONFERENCE

Session 13  
Topic and Assignment  
February 17

IV. The Well Managed Organization and the Challenge of Change:

New Approaches to Managing Patients, Nurses, and Physicians

Case: Patients Like Me
This final session will focus on digitization in health care. Patients like me is an on-line community where patients share their personal experiences with a disease, find other patients like them, and learn from each other. The company was founded by a family when a relative was diagnosed with ALS. As more businesses take life on the internet and rely on user generated content, understanding their business models and growth opportunities is important.

Questions:
- Why do patients join PLM? Does the platform work for any disease?
- What are the reactions of physicians and Pharma to these platforms?
- Should PLM launch a general platform

Case: Cleveland Clinic: Growth Strategy 2014

Questions:

a) How well is Cleveland performing? What is their approach to health care management? B) What is their strategy for improving value for patients? C) What are the areas for improvement?

1) “Health Care’s Service Fanatics: How Cleveland Clinic leaped to the to the top of patient-satisfaction surveys” Harvard Business Review May 2013
**Tips on Preparing Cases**

We will discuss the cases in class. Here are my recommendations—You should study the cases and prepare a 2-3 page “brief” on the 2 cases you select. The brief is intended to organize your ideas and facilitate class discussions. Your team should write the brief after you have studied the cases, readings and questions.

After you have studied the case and skimmed the readings use the following format:

1. **Frame the problems/issues into a decision question:** frame the issues and/or problems around a key goal or objective, differentiating the long from the short-run. The question might be—”What is the best course of action for this case in order to achieve X”? In some cases the goals may not be clear.

2. **Analyze the problem/situation by identifying the pertinent facts vs. assumptions.** Ask yourself three questions: where did the facts come from, how do I know they are correct? Are they a final, reliable reality or an interpretation or an assumption? Be sure to identify your assumptions explicitly. What concepts or tools are most useful to understand the problem? Some cases have quantitative solutions, such as:

   “What is the cost of treating pancreatitis, cardiac dysrhythmia, and liver cancer under each accounting system?” This brief is straightforward, however, make the assumptions explicit.

Or some have very specific questions:

a) What is a care program?

b) What is needed to make care programs work? Who are the stakeholders?

c) Is there a bottleneck? What is the likelihood of a bottleneck?

d) What are the lessons for health care management?

3. **Alternatives and consequences:** if appropriate, think about the alternatives courses of action and the full set of consequences. Analyze each alternative and consider what the trade-offs are. What are the risks and uncertainties? Remember to relate your analysis to your recommendations.

4. **Recommendation:** identify, justify, and support your recommendations, giving careful consideration to rebuttals from your classmates.

5. **Implementation:** (if applicable) assess the feasibility of your solution by developing a plan of action necessary to implement the recommendation.