



AMAR BHIDÉ

Course Syllabus:

Lessons from Transformational Medical Advances

The course uses case-histories of transformational advances to encourage and guide innovators in health care and other industries. After describing these 'ends and means,' this syllabus summarizes a [simple framework](#) we use in the course, the required [pre-class submissions](#), [final paper](#), and [grading methodology](#), followed by a provisional course [schedule](#) and [daily assignments](#).

Ends and Means.

Popular media routinely tout imminent breakthroughs that often fizzle. We examine advances that indisputably changed medical practice in the last quarter of the 20th century. The case histories suggest that protracted, *multiplayer* innovations – not solitary breakthroughs – produce transformational results. Yet venturesome individuals who don't follow the crowd remain crucial.

Engaging stories make the vast number of facts presented in the case histories memorable. But the course treats learning new facts mainly as a valuable byproduct. Rather, we rely on the case histories in two more subtle ways, namely:

Developing skills and judgment, particularly in recognizing opportunities and anticipating problems, adapting ideas from other domains, evaluating alternatives and so on. Learning by personally doing – or by personally [watching](#) – is often crucial for developing 'skills of the hand,' such as changing a car tire. But for many 'skills of the mind and heart,' learning from past instances is more practical and feasible. Studying historical wars and battles has long been an important part of training military leaders for example. Moreover, the skills and judgment emphasized go beyond particular techniques (which may become obsolete) and support more than just medical innovations.

Sharpening goals and aspirations. The case histories include stirring stories that showcase the romance of human progress. But they do not preach or sugarcoat: they include controversies about the overuse of antidepressants and of expensive procedures. Great adventures, they also remind us, require great risks and difficulties and succeeding in what's safe and easy – or just financially rewarding -- is not always uplifting. In the coronary bypass case for example we encounter a German researcher who fails to "meet the scientific expectations" of his boss, loses his job, switches from surgery to urology, joins the military, and becomes a prisoner of war. Eventually he gets a Nobel prize, but can never secure a professorship because he had not finished his PhD. The boss of the surgeon who performs the first successful bypass forbids him from doing another. An Argentinian who then does many bypasses at the Cleveland Clinic and comes to be known as the 'father' of the surgery, ends up committing suicide after the institute he starts in his homeland cannot pay its bills.

While the setbacks and failures described may discourage some from attempting great leaps, the case histories should nevertheless inspire many prudent initiatives. Unlike hagiographies of larger-than-life pioneers, the stories have 'ensemble' casts. Stars appear but don't dominate. Rather the stories show how innovation accommodates a wide range of talents and temperaments. We will see how measured contributions that are not individually revolutionary or risky can, added up, make an important difference. Therefore, the course should help shape and stimulate your aspirations -- but not past your personal breaking points.

The course's emphasis on skills, aspirations, and stories reflects my experience of teaching and researching entrepreneurship for more than thirty years. Conversations with former students suggest that the emotional and visceral aspects and stories of startups leave a more profound and lasting impression than the analytical aspects. When I surveyed self-employed graduates of HBS's MBA program I asked what they wished they had better learned. Most responses related to skill development (learning to sell, for example) and exposure to the stresses of starting a business.^a Similarly, my research on high-growth companies suggests that a startup's success depends more on the founder's skill and determination than on creative business ideas and models.^b

Framework

A [Note on Productive Knowledge](#) provides a "simple walking stick" (as [Roethlisberger 1977](#) put it) for analyzing the case histories and for discussing advances beyond the medical sphere. It treats innovation as a multiplayer process undertaken by and for the many, rather than as an elite, 'star-centric' activity. And the Note classifies the distinctive challenges of multiplayer innovation (in addition to the specialized industry and technology-specific issues) into functions such as goals setting, evaluation and testing, codification, and communication. Like tags and keywords for documents or music, the functional categories can help you order and retrieve observations and inferences made from the case histories. The categories should also continue to support your learning and development long after the particulars of this course are forgotten.

The functional walking stick which (like the skills and attitudes targeted in this course) is designed for more than just medical innovation will also help us broaden the class discussions. For instance, we will discuss the generic challenges of codification along with the Prozac case history. Additional materials and preparation questions (see the [daily assignments](#) section of this syllabus) will stimulate these broader discussions and an extensive optional reading list will help you dig more deeply if you wish.

Pre-class submissions.

The case histories contain specific questions after each section and at the end. Students are required to enter very brief answers (less than ten words) to the questions on an online form by 9 am of the day of each class. I will create slides from the submissions which I will use to start the class (instead of the traditional student 'opening') and to continue the class discussion.

The submissions require less than an hour of additional work over the course of the term.

My experience since 1991 (when I first started requiring such submissions) suggests that this modest additional effort provides attractive returns, including: 1) Practice in confronting the uncertainties that

^a [Bhidé. 1996. "The Road Well Traveled: A Note on the Journeys of HBS Entrepreneurs." HBS Case 396-277.](#)

^b [Bhidé 2000. *The Origin and Evolution of New Businesses*. New York, NY: Oxford University Press, 2000.](#)

innovators typically face. 2). Classes with fewer superficial comments because students are better prepared and, more importantly, have a point of view. 3). Broader participation: the instructor can draw in the quieter, well-prepared students with prior knowledge of their perspective on the case. 4) The elimination of anxiety about being asked to open a class.

If you do not submit a response, I will assume you have also not prepared the material. However, if you have a technical problem do not waste too much time trying to submit your response. Just send me an email telling me that you tried but could not; I will take you at your word. Likewise, if you cannot submit because of a personal emergency, please let me know.

(As with traditional case courses, the [daily assignments](#) in this syllabus include questions raised by the case histories that will provide the basis for discussions about the broad ‘takeaways.’ These questions do not require any submissions, however.)

Final Paper.

Instead of a final exam, self-selected groups (of up to 3 students) will write papers on the development of a noteworthy (medical or non-medical) advance that has already proven its practical value. Like the final papers written for my entrepreneurship class (see the compilation, *Tales from Successful Entrepreneurs*) the papers should include: a description of what happened (the “story”); analysis of specific choices; and general reflections and takeaways. ([An Appendix](#) contains detailed guidelines, rules, and the criteria I will use to evaluate the papers).

Grading.

My grading favors regular and conscientious contributions over occasional brilliance and values learning over sharply “objective” evaluations. Thus, for example, I would not use a “difficult” exam instead of a final paper, merely to produce more “defensible” grades. I also have greater confidence in my ability to evaluate final papers than class participation but recognize that participation contributes more to the “common good.”

Accordingly, I will divide class participation and final papers into five roughly equal “buckets”, A through E. I will then use the sequence of bucket combinations shown below to assign Category Is and IIIs to reach the maximum Is permissible and the minimum IIIs required.

Sequence for assigning Category Is and IIIs (going from the top down)

Category Is	Category IIIs
‘A’ paper + ‘A’ participation	‘E’ paper + ‘E’ participation
‘A’ paper + ‘B’ participation	‘E’ paper + ‘D’ participation
‘A’ paper + ‘C’ participation	‘E’ paper + ‘C’ participation
‘B’ paper + ‘A’ participation	‘D’ paper + ‘E’ participation
‘B’ paper + ‘B’ participation	‘D’ paper + ‘D’ participation

Note: Failure to meet requirements will lead to an automatic Category III, or in extreme cases, a Category IV. Specifically, more than two absences or missed pre-class submissions (out of the 12 classes remaining after the add-drop period ends) without good cause, [as defined by the MBA program](#), constitute a failure to meet requirements. If you choose to miss class for other reasons, your absence will be counted towards your “quota” of two classes.

*Schedule and Course Outline (Tentative).*Lessons from Transformational Medical Advances

Visiting Professor Amar Bhidé; amar@bhide.net or abhide@hbs.edu

#	Dates*	Case Histories**	Additional discussions**
<u>Comprehensive/ Introductory</u>			
1	1/26/2021	Ulcer Treatments	Multiplayer Innovation
2	2/04/2021	HIV/AIDS	Common Multiplayer Tasks
<u>Drugs</u>			
3	2/11/2021	Tamoxifen	Goal Setting Conjecture
4	2/18/2021	Cephalosporins	Role of Science
5	2/25/2021	Prozac	Codification
<u>Procedures</u>			
6	3/04/2021	Mammography	Evaluation and Testing
7	3/11/2021	Laparoscopy	Communication
8	3/18/2021	Endoscopy	Strategic Commitment
9	3/25/2021	CABG	Responsibility And Authority
<u>Devices</u>			
10	4/01/2021	CT	Incentives
11	4/08/2021	MRI Ultrasound	Role of Individuals Disruptive Innovation
<u>Promising Contemporary</u>			
12	4/15/2021	CAR-T cell Therapy Fecal Transplants	Learning from Histories
<u>Valedictory</u>			
13	4/22/2021	Cicely Saunders/Hospices Odyssey Health Care	Institution Building

* 2:40-4:40 pm tentatively in Hybrid Class 007

** See [Daily Assignments](#) (in the next section) for Required Readings, and links to the required pre-class submissions.

Daily Assignments

Antibiotic Treatments for Ulcers

The development of a simple cure for ulcers introduces several themes and ideas examined in the course. The dramatic story (which covers several decades in just 10 pages of main text) describes how an improbable hypothesis led to the virtual elimination of an ancient, widespread disease.

An accompanying reading ('Traditions and Rules.') provides a very short 'history of Western medicine' and summary of current institutional arrangements (e.g., how the U.S government finances research and regulates new tests and treatments). This history and summary will provide useful information and context for the rest of the course – as well as a provocative hypothesis about the challenges of medical innovation.

Readings:

- *Note on the Development of Antibiotic Treatment for Ulcers* (9-321-053)
- *Traditions and Rules that Limit Medical Innovation*. (Bhidé Critical Review)
- *First three pages of this Syllabus*

Pre-class submission (Required).

This Note contains questions after each section and at the end of the Note. Please enter **very brief** answers (less than ten words) to the questions here: <https://forms.gle/v7kkpX2tajA51994A>

Broader Questions (to think about in preparing for class)

What did you find most surprising about the Note and the *Traditions and Rules* readings (beyond just facts you might not have known about)?

What role did scientific research and understanding play in developing ulcer treatments?

Does the H-Pylori case history support the *Traditions and Rules* article (which was written before the Note was completed)? What would you change in the article?

Controlling the HIV-AIDS Pandemic (+ Common Multiplayer Tasks)

The HIV-AIDS Note provides a second, and more detailed introduction to the power of multiplayer innovation. The accompanying Note on Productive Knowledge provides a framework that will help guide our analysis of the case histories that we discuss in the rest of this course.

Readings:

- *Note on the Development of HIV/AIDS Controls, Tests, and Treatments* (9-321-052)
- *Note on Productive Knowledge* (HBS Working Paper 21-010). (Appendix, optional but will be required for a subsequent class)

Pre-class submission.

Submit answers to questions contained in the Note here: <https://forms.gle/xnjViGGppBNB2Vw8A>

Broader Questions (to think about in preparing for class)

What could have been done differently to accelerate the rollback of the AIDS pandemic?

How did the goals, objectives, and problem specifications -- the “ends” -- of the different players affect what they did -- their “means”? How would you evaluate their performance?

What “exceptional” rules or changes adopted by the FDA should the agency have continued?

What general lessons about containing pandemics does the HIV/AIDS suggest?

Tamoxifen (+ ‘Goals’ and ‘Conjectures’)

The Tamoxifen Note is the first of three ‘drug’ case-histories in this course. It describes a “gold standard” breast cancer therapy that emerged from a failed effort to develop a contraceptive. The accompanying readings support ‘sidebar’ discussions on ‘goal-setting’ and ‘conjecture’ – two tasks that provide a useful frame for analyzing ‘multiplayer’ innovation (as discussed in the Note on Productive Knowledge, assigned for the previous class).

Required Readings/videos/Podcasts:

- *Note on the Development of Tamoxifen* (321-058). (The main text is just seven pages so please use the “extra time” to read the exhibits carefully.)
- *How Strategists Really Think* (HBR, Gavetti and Rivkin on Analogical reasoning)
- [Obliquity](#) (John Kay TedX talk on indirect goals and objectives)
- [Blogpost on Objectives and Key Results \(OKR\) systems](#) OR [Video Presentation on Objective and Key Results \(OKR\) systems](#)

Pre-class submission

Answer questions contained in the Note here: <https://forms.gle/BMzvmKUkdCXsrGPN8>

Broader Questions (to think about in preparing for class)

To what degree did Beatson’s conjectures/hypothesis correspond to “analogical reasoning” (in Gavetti and Rivkin’s HBR article)?

Evaluate the choices ICI’s top managers made? What were their implicit or explicit goals? What were their “conjectures” or “hypotheses” -- colloquially put “What were they thinking!?”

What similarities and differences do you see in Doerr’s OKRs and Kay’s Obliquity?

What have you learned in your other courses (and from your experiences) on goal setting and problem specification?

Optional Readings/videos/Podcasts:

Listed under ‘Goal Setting and Problem Specification’ and ‘Conjecture’ in extended reading list.

Cephalosporins (+ Relationship between Science and Technology)

The development of Cephalosporins – the most widely used drugs to control infections in hospitals – shows the unusual nature of the supply and demand for new antibiotics. The Note also illustrates some of the interactions and contrasts between scientific and technological research (discussed in the Appendix of the previously assigned reading on Productive Knowledge.)

Readings/Podcasts:

- *Note on the Development of Cephalosporins* (321-059)
- Excerpts from ‘In Our Time’ podcast on penicillin (first 37 minutes)
- Appendix in the *Note on Productive Knowledge* (HBS Working Paper 21-010).

Pre-class submission.

Answer questions contained in the Note here: <https://forms.gle/jNGcr8EiX7CgTdVa7>

Broader Questions (to think about in preparing for class)

How has the demand and supply for antibiotics evolved over the last 100 years?

Who has the greatest/least incentive and capacity to adopt novel antibiotics (hospital doctors, Primary Care Physicians/General Practitioners, managed care organizations, other?)

Do large pharmaceutical companies have the incentive and capacity to continue to develop new antibiotics? If not, what opportunities does this provide small drug developers?

What have you learned in your other courses (and from your experiences) about the relationship between science and technology? What does this case history add?

Optional Readings:

Tales From Successful Entrepreneurs (396-050). Browse/skim for ideas about your final paper and for light reading!

Prozac (+ ‘Codification’)

Prozac, one of the most widely used -- and controversial -- drugs ever developed, helps us think about the conditions that enable “blockbusters.” The drug’s popularity also illustrates the subtle role of ‘codification’ in the diffusion of medical treatments and practices.

Readings:

- *Note on the Development of Prozac* (9-321-057)
- *Emergence of Clinical Practice Guidelines* (Extracts from Weisz et al.)

Pre-class submission

Answer questions contained in the Note here: <https://forms.gle/QepvWeHUSkQy7hQx7>

Broader Questions (to think about in preparing for class)

What does the Prozac’s case history suggest about the conditions and choices that produce “blockbuster drugs”?

Evaluate Lilly’s development and commercialization of Prozac, especially in comparison to what ICI did with Tamoxifen. What aspects of its model remain relevant?

What general lessons do the emergence of clinical practice guidelines (in the Weisz reading, the Prozac Note, and prior Notes) suggest? How do these lessons apply to fields outside medicine?

What have you learned in your other courses (and from your experiences) about the codification of knowledge and practices?

Optional Readings/videos/Podcasts:

- Getting it Right the Second Time (Szulanski and Winter HBR)
- Judgement Deficit (Bhidé 2010 HBR) OR podcast at <https://hbr.org/2010/09/the-big-idea-the-judgment-deficit>
- *The Art of Evidence-Based Medicine* (Christopher Worsham and Anupam B. Jena HBR Reprint H04RH1 Published on HBR.ORG on JANUARY 30, 2019)
- Other materials listed under ‘Codification’ in extended reading list.

Mammography (+Evaluation and Testing)

Mammography is the first of three classes on 'procedures' – although as with most procedures its development included the development of complementary devices. The development of mammography includes challenges of 'testing and evaluation' which inevitably arise in any kind of innovation and are especially controversial in medicine.

Readings:

- *Note on the Development of Mammography* (9-321-064)
- Assessing the Gold Standard — Lessons from the History of RCTs (Bothwell et. al)
- *Making Economics More Useful* (Bhidé 2020) (**SKIM** Section 1 and conclusion only)

Pre-class submission.

Answer questions contained in the Note here: <https://forms.gle/DrSodSddd5gvPXm99>

Broader Questions (to think about in preparing for class)

What does the mammography case history (and the earlier case histories especially on HIV/AIDS) suggest about the similarities and differences in advances in mass screening and drug development?

Evaluate the choices made by regulatory and public health choices about mammography made in the U.S., Europe, and Japan.

How should you evaluate a new test or evaluation procedure: What criteria (besides accuracy and cost) might you apply? What deficiencies or tradeoffs would you accept? How would you check the performance of the test against your criteria?

What similarities and differences do you see in testing 'medical' and 'business' hypotheses ('conjectures')?

Optional Readings/videos/Podcasts:

William Bynum's "Medicine in the Hospital." In *The History of Medicine: A Very Short Introduction*, 43–67. HIGHLY RECOMMENDED; and others in 'Evaluation and Testing' in extended reading list

Laparoscopy (+ Communication)

The development of laparoscopy (and its other 'minimally invasive' variants) helped transform general surgery. Unlike some other advances in the course, it did not require or produce Nobel-prize winning scientific advances. Its development however does include many features and challenges of protracted, multi-player development, including 'communication' especially with potential end-users (i.e., patients).

Required Readings and videos:

- *Note on the Development of Laparoscopic Surgery* (9-321-060)
- Steve Jobs's presentations launching the iPod and iPhone (videos)

Pre-class submission.

Answer questions contained in the Note here: <https://forms.gle/oyfHGJTBGGVb2o8y7h>

Broader Questions (to think about in preparing for class)

What does the case history suggest about the catalysts and barriers that innovators face in developing and propagating a new surgical procedure? How are these different from the development and marketing of new drugs?

The case suggests that 'traditional' mass media helped popularize laparoscopy. How might social media and other new communication technologies affect the dissemination of a similar procedure now? What kinds of procedure would you expect to be most affected?

What might innovators from other industries (including medicine) adapt from the communication strategies of companies like Apple?

How might the adoption of laparoscopy be different in middle to low-income countries?

Optional Readings/videos/Podcasts:

Listed under 'Communications' in extended reading list.

Endoscopy (+ Strategic Commitment)

A physics-based invention started the transformation of an age-old diagnostic procedure, while its subsequent development combined new clinical practices and technological advances (but not much cutting edge 'science'.) Physician innovators led the development and diffusion of the clinical practices whereas businesses made important 'strategic commitments' to new technologies, many adapted from outside medicine.

Readings:

- *Note on the Development of Endoscopy* (9-321-061).

(The main text is just 11 pages and the exhibits do not require detailed analysis)

- *Competition and Business Strategy in Historical Perspective* (Ghemawat -- Business History Review 76 (Spring 2002): 37-74. **SKIM**)

- *Gaining Advantage over competitors* ([McKinsey Quarterly compilation](#)) **SKIM**

Pre-class submission.

Answer questions contained in the Note here: <https://forms.gle/ydpQTKGnKULipZ8D8h>

Broader Questions (to think about in preparing for class)

What similarities and differences do you see in the development of laparoscopy and endoscopy?

How did the “attractiveness” (as evaluated by strategic frameworks) of the endoscopy market change over time? In what way would such an evaluation have helped industry entrants and participants?

When and how can common business strategy techniques help innovators? When and how might they be not very useful or even harmful?

Optional Readings/videos/Podcasts:

Listed under ‘Strategic Commitment’ in extended reading list.

Coronary Arterial Bypass Grafting (+ Assigning Authority and Responsibility)

The length of this case reflects the enormous, multi-faceted challenges that numerous innovators overcame over many decades to develop an expensive, complicated procedure that extended and improved millions of lives. It illustrates the full range of multiplayer challenges including allocating organizational responsibilities and authority to effectively harness the initiative and resourcefulness of many individuals.

Readings:

- *Note on the Development of Coronary Artery Bypass Grafting* (9-321-062)
- *The Halfway House: Coordination through Organizational Authority* (Bhidé 2010) p. 46-51
- *Venturesome Consumption* (Bhidé). **Only highlighted material**

Pre-class submission.

Answer questions contained in the Note here: <https://forms.gle/ypuhmRY8z9539AM27>

Broader Questions (to think about in preparing for class)

What similarities and differences did you find in the development of CABG and the earlier advances, particularly medical procedures?

What does the Note add to your views about “conjectures,” “testing,” and “communication” tasks?

What have you learned or observed about the relationship between organizational structures and the development and effective use of new technologies?

What similarities and differences do you see in the structures of medical and “industrial” organizations that affects their capacity to develop and use technological advances?

Optional Readings/videos/Podcasts:

Listed under ‘Assigning Authority and Responsibility’ in extended reading list.

Computed Tomography: Beyond X Rays

X-ray imaging, introduced in 1895 revolutionized surgery, vastly increasing the scope and reliability of non-invasive preoperative diagnosis. CTs, combining older X-rays with newer computing technologies renewed the revolution more than seventy years later. The much higher cost of CT equipment however created controversy and influenced industry entry and exits.

Readings:

- *Note on the Development of Computed Tomography* (321-055)
- *EMI and the CT Scanner (A) and (B)* HBS Case numbers 383-194 and 383-195

Pre-class submission.

Answer questions contained in the Note here: <https://forms.gle/bnBhK4wAwEhhvw1W8>

Broader Questions (to think about in preparing for class)

What accounts for the quick adoption of CTs in the U.S. after they were introduced in the 1970s? Were U.S. insurers too “lenient” in reimbursing CT scans? Were European payors too “strict”?

How might the CT industry have evolved differently if Congress had given the FDA the authority to regulate medical devices before 1972/73?

As the head of GE’s medical products division in 1997, would you encourage more investment in CTs or use the CT business as a source of cash to fund other businesses?

Optional Readings/videos/Podcasts:

Listed under ‘Incentivization’ in extended list.

MRIs – High Quality Imaging

MRIs, developed shortly after CTs, provided sharper, safer imaging. Besides their medical and technological significance, both devices illustrate an important kind of ‘multi-player’ innovation that emerged in the 20th century: the systematic development of complex, high-ticket, science-and-technology intensive capital goods, such as commercial and military aircraft, power generating plants, high-speed rail, mainframe computers, and communication networks. Large, vertically integrated multinational organizations have often led this development, under the oversight of national and local regulatory bodies. Systematic routines of large users have likewise often governed the acquisition of the high-ticket products. The CT and MRI case illustrate the distinctive features of this model in the medical sphere.

Readings:

- *Note on the Development of Magnetic Resonance Imaging* (321-056)

Pre-class submission.

Answer questions contained in the Note here: <https://forms.gle/uwiYyFZN5cDb8hbV6h>

Broader Questions (to think about in preparing for class)

What kinds of innovations offer the most/least scope for ‘maverick’ individuals?

How does regulation/reimbursement affect the speed and direction of technical changes in medical devices (as compared to other kinds of devices)?

As a large, diversified “user” (e.g., a hospital or a network of imaging centers) how would you select suppliers and make plans for acquiring emerging technologies?

Ultrasound Scanning – Cheap, Versatile and Safe

Ultrasound is an older imaging technology than CT or MRI, but not as old as x-rays. The transformational evolution of this earlier -- and considerably lower-cost --- technology provides a useful contrast to the development of 'high-ticket' CTs and MRIs – and ideas for thinking about the current development of 'wearable' devices sold to individual consumers.

Readings:

- *Note on the Development of Ultrasound Scanning* (321-054)
- *What is Disruptive Innovation?* (Christenson, Raynor and McDonald)
- *Clay Christensen's theories are great for entrepreneurs, but not executives* (Bhidé and Ghemawat)

Pre-class submission.

Answer questions contained in the Note here: <https://forms.gle/vTi6JUNwnS3Z6tdH6h>

Broader Questions (to think about in preparing for class)

What industry that you have worked in or studied is ultrasound most like, in terms of its evolution and competitive dynamics?

To what degree do advances in ultrasound conform to the Christenson model of “disruptive innovation?”

How would you compare advances in diagnostic imaging to advances in drugs and procedures?

What do the older diagnostic advances tell us about opportunities in ‘wearable’ consumer devices?

CAR-T Cell Therapies (+ Fecal Transplants)

CAR-T cell treatments and fecal transplants are different in the extent of their scientific and technological foundations, the investment they have attracted from established pharmaceutical companies, and the costs of ongoing administration. There are also similarities. Both are considered highly 'promising' treatments that may, but have not yet, had a widespread impact on treating patients. Both have emerged after decades of research that challenged prevailing beliefs. And both provide us with an opportunity to consider how – and to what extent – we can apply historical lessons to on-going contemporary advances.

Readings:

- *Note on the Development of Chimeric Antigen T-Cell Receptor Therapies* (9-321-063)
- *Note on the Development of Fecal Transplants* (9-321-065)

Pre-class submission.

Answer questions contained in the Note on CAR-T here: <https://forms.gle/Ub9YMFdcLzXPhfbD6>

And on Fecal Transplants here: <https://forms.gle/z7TJDZHzooAPYCLA>

Broader Questions (to think about in preparing for class)

How likely are CAR-T/Fecal transplants to become mainstream treatments?

What differences would regulation of CAR-T/fecal transplants as medical 'procedures' rather than drugs make to the path of their future development and adoption?

As the head of a cancer center that does not currently offer CAR-T treatments, when would you consider adding such treatments?

To what degree does the development of CAR-T and fecal transplants correspond to the historical patterns of medical advances? To what degree do they represent a break with history?

Cicely Saunders and Modern Hospices

The hospice movement, like CABG and many other case histories illustrates interdependencies between technical and organizational advances (palliative care and hospices, in this instance). And, although individuals rarely produce either on their own, exceptional innovators (like Cicely Saunders) often have outsized influence. They shape both the “ends” or “goals” of technological and organizational advances as well as the means chosen to pursue these ends and goals.

Readings:

- *Dame Cicely Saunders and the Modern Hospice Movement: A Brother's View* (321-102)
- *Odyssey Health Care* (9- 809-052) **SKIM** just the main text.

Pre-class submission.

The case ends with a question about whether Cicely should or should not have opened “subsidiary” hospices. Please enter your response here: <https://forms.gle/9jpeqd2b5zRvYc8C7>.

Broader Questions (to think about in preparing for class)

How did Cicely Saunders's choices and initiatives affect the development of the hospice movement and the specialty of palliative care?

How were these choices different from those you read about in *Tales from Successful Entrepreneurs* or that we have studied earlier in this course?

Can good hospices operate as commercial businesses?

What does this case and the earlier Notes tell you about the role of individuals in shaping the ‘goals’ of medical (and organizational) innovations?

Optional Reading:

[Building the Professional Firm: McKinsey & Co.: 1939-1968](#). HBS Working Paper 95-010

Appendix: Final Paper: Guidelines, Rules, and Criteria

Instead of a final exam, you will form self-selected groups (of up to 3 students) to write papers on the development of a noteworthy advance that has proven its practical value. The advance can include a device, technology, system, or organizational template from any field. The case histories in this course, [drawn mainly from Fuchs and Sox's 'top-30' list](#), provide examples from the medical sphere. Topics outside medicine could include the development of personal computers, spreadsheets, mobile telephony, container shipping, and multi-player techniques included in this syllabus and its optional readings (such as Human Centered Design, 'agile' project management, Objectives and Key Result (OKR) systems, Balanced Scorecards and A/B tests.)

The advance does not need to be an indisputable success – almost all important innovations have some limitations and drawbacks. You can also write about advances that had a significant impact but then declined. Do not however write about 'promising' initiatives that have not proceeded beyond the conceptual or experimental stage, even if they have received a lot of money and publicity. For instance, if you write about a new drug or device it should have already entered clinical use. Also, avoid writing about specific companies or organizations (such as Facebook or Amazon) unless (like the St. Christopher's hospice) they have created a 'template' that has been more broadly adopted. You may however write about the development of technology that one company came to dominate (e.g., Google in on-line search) provided the paper doesn't focus on what just the dominant company did.)

The paper should contain three distinct segments which:

Describe the basic story of the advance, including the individuals and organizations who made it happen. The case-histories in the course provide a model, but you don't have to follow it. (70% of credit)

Analyze the facts in your description. This segment should include insights and explanations about how and why the advance progressed, the contributions and missteps of the players, and so on. (20% of credit)

Reflect upon the broad ideas illustrated by the specific story. What general principles or rules of thumb did the story of the advance reinforce in your mind, lead you to modify, or cause you to reject? What did you learn that will influence your career in the next five years? (10% of credit)

The papers should be about 5,000 to 7,000 words long (and no more than 15 double spaced pages plus appendices) with the length of each segment roughly reflecting the credit assigned.

Papers MUST be properly "sourced"/annotated. A general "bibliography" will not be adequate – the reader must be told where specific facts or quotes came from. I would recommend learning to use the open source package Zotero.

"Good" papers will also: 1) explain the dynamics of the advance -- how one decision or event led to another or precluded some other option. 2) Avoid clichés and platitudes -- focusing instead on surprises and sharp 'do's and 'don'ts that might not otherwise occur to the reader. 3) Offer conditional ('if-then') propositions rather than sweeping, generalized claims. 4) Support propositions with evidence and reason. 5) Show that you learned something from the course by for example using comparisons with the cases discussed or by supporting, challenging, or modifying ideas in the readings. 6) Use clear language and an easy-to-follow structure. Simply put, a good paper will (like the papers in *Tales from Successful Entrepreneurs*) be one that will have value many years from now and you will remember with pride!

Endnotes