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The Slow Pace of Fast Change

The more innovative the technology, the slower its adoption. Plan for it.

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ONE

The more innovative the technology, the slower the adoption

Recent work in cell therapy brought an observation that I have seen recurring over twenty years in this industry back to mind. During that time I have had the good fortune of having been close to several game changing innovations: the foundational research behind HIV treatment at the Pasteur Institute, the sequencing of the human genome at Incyte Genomics ushering in the genomics and proteomics era, the emergence and growth of biopharmaceuticals at GE Life Sciences, and more recently the advent of AI-derived algorithmic diagnostics at Fibronostics. In each case the technology took longer to reach its potential than innovators and observers expected. In fact, the more innovative the technology, the longer it took. This paper examines why the pace of fast change is slower than many plan for, and what boards, executive teams and functional leaders can do to bridge the time and cost.

Innovation = Disruption. The more innovative a technology, the slower its adoption, because something that is “innovative” is also disruptive.

The Paradox: We are quicker to accept and embrace the innovation part than we are to embrace and plan for the need to manage through the disruption the innovation will cause

Adoption of great, game changing technology is not slow because of lack of value of the new technologies. It is slow because of the amount and type of change game changing technologies require. Literally, it means the game itself has to change, making game changing technology difficult to implement by definition.

Two technology platforms illustrate the paradox. Both are highly innovative, game changing, and both are now at the stage of early market adoption after commercial launch.

Other than that, they share very little: science, customers, regulators, end markets, value chains and economics all differ. One thing they have in common is that both are genuinely innovative, and both therefore require substantial change before reaching their fuller clinical value potential.

- **Cell and stem cell therapies.** A group of therapies and technologies where *your* cells get “programmed and armed” to become *your* medicine. Sickle cell anaemia is curable, lupus patients have reached remission after a single infusion, and children born deaf have gained hearing.
- **AI-derived algorithmic non-invasive diagnostics.** Routine blood values combined to give an organ-level insight no single value or even biopsy can come close to. A step change in what can be detected and how early, when earlier diagnosis has become a socio-economic imperative.

In both cases the end game is not in question: both will become the standard of care in therapeutics and diagnostics over time. What remains uncertain is the time and the path they will take to get there.

A note on who this is written for. It is less useful for companies with open-ended venture funding, where burn rate is secondary and a long unprofitable march to the destination market is an accepted cost of ambition. It is written for leaders expected to part-fund their own growth and to achieve significant commercial milestones between funding rounds. That group of leaders is probably growing.

Funding is becoming smaller and smarter. GRAIL, discussed later, raised roughly \$2bn over a decade mainly on the strength of its science and ambition of its vision. Funding on that scale will likely be rarer. The amount of time and money teams will have at their disposal to manage through extended periods of time en route to revenue and profitability will likely decrease.

None of this is an argument against ambition. Breakthrough technologies are very much desired. The question is not whether to pursue them but how to pursue them thoughtfully. Helmut Schmidt's remark that anyone with visions should go and see a doctor is usually quoted against visionaries. It reads better as a caution against blind ones. What follows is not an argument for lowering sights. It is an argument for being clear about what reaching ambitious goals will take and planning ahead.

TWO

Why increasing innovation slows adoption

No medical technology generates value in isolation. Value is created when it is adopted broadly clinically and that adoption is profitable. The action of others is needed for that to happen: a clinician alters a pathway, a hospital builds a capability, a payor writes a policy, a laboratory changes what it reports. Sometimes all of the above is needed. The more revolutionary the technology, the more change to the status quo and its standard practices it will require.

Those changes are mainly controlled not by the innovator but by existing stakeholders with decision rights, who did not request the technology, are not compensated for adopting it, and currently operate a system that works adequately without it.

This is the slow pace of fast change. Technology advances at the speed of science. The system receiving it advances at the speed of the slowest stakeholder required to change for its adoption to happen. The gap between the speed of technology and the speed of adoption is the cost of change. The cost of change increases with how innovative the technology is.

The cost of change has two components: build cost and switching cost

Simplistically speaking, the cost of change has two components that behave differently. Establishing how much change an innovation requires, and of which type, is the first piece of analysis to do.

	WHAT IT IS	WHO BEARS IT	HOW IT SHOWS UP
Build cost	The value chains, assets and capabilities that do not exist yet	The innovator, and whichever parties can be persuaded to move first	Capital needed before any revenue can be made, against an uncertain payback period
Switching cost	The existing arrangements, revenue lines and roles the technology displaces	Incumbents, and the stakeholders whose current economics benefit, thin as they may be	Resistance, passive far more often than active: a policy never written, a pilot that never scales, a meeting repeatedly deferred

Therapeutic cell and stem cell therapy is more build-dominant: no incumbent position is being defended, but a new value chain must be funded into existence. This is CAPEX/OPEX, project management heavy.

Algorithmic diagnostics is more switching-dominant: no new infrastructure is required, but established arrangements in the existing value chain must change against the passive resistance of the parties operating them. This is time and burn rate heavy.

Key questions are better asked earlier

Which parties must change their behaviour before this technology can be used broadly and profitably, and what does that change cost them?

How much time and cost will that change require, assuming every stakeholder involved acts in their own self-interest?

Not whether the technology is good enough, and not the size of the market. Neither question is individually predictive of adoption.

Why the cost of change is particularly challenging for smaller companies

An established incumbent that underestimates build or switching cost records a weaker year. A young company that does the same can run out of capital while holding an excellent product in its hands. The pattern is consistent: the evidence base strengthens, the commercial pipeline grows, and revenue still does not follow.

Management teams would benefit from examining their own position earlier. Founders and executives are typically closest to the technology, having taken it from laboratory to first commercial sale. That proximity is an asset in development and a liability in commercialisation: the qualities that make a team excellent developers and advocates are not the qualities that drive a hard-headed focus on what must change in the market for their technology to succeed in it.

THREE

Bridging the change gap: how and when to think about it

Where the period of change anticipated is long and the build or switching cost is material, a strategy that funds and bridges the gap is called for and may be essential if further funding rounds are difficult to secure. A bridging strategy has two objectives.

The first is cash: funding the company through the period in which build or switching cost is incurred, to offset a burn rate that is often higher, and a period that is often longer, than leaders anticipated.

The second is assets: the same work that brings in cash builds the capabilities, proof points and credibility required to win in the primary market. Botox is a well known example. The cosmetic business paid for the manufacturing scale, the safety record and the physician familiarity that the therapeutic indications later benefited from. The franchise now earns more from therapeutic indications than from aesthetics. Therapeutics took longer; cosmetics paid for it and paved the way.

A diagnostics company that runs conventional molecular testing through a laboratory acquired ahead of its algorithmic tests, combined with a government-sponsored population screening program for those tests, achieves the same result: early revenue, billing experience and significant clinical evidence, all in parallel with the change management work of activating US insurance coverage payor by payor.

An offensive strategy, or a defensive reaction

A company starts developing the primary market for two or three years, finds adoption slower and more expensive than planned, begins to understand the build and switching costs attached to enabling changes needed in the primary market (often knowable from the outset), and only then looks for a way to bridge the time and cost. It reads like a defensive reaction. The board asks why a game changing technology is not gaining traction, and the organisation is asked to pursue alternative revenue without understanding why, suggesting to them that their technology may not be as great as they thought.

The alternative is to establish at the outset what change will be needed in the primary market, how long that will take and what it will cost, and to develop the bridging strategy as the plan before anyone asks for it: *to win in market A, we will build revenue and capability in market B while the required change in market A is worked through.*

Announced early, socialized and planned for, a bridging strategy is offensive and smart. Discovered late, it is defensive and feels reactive to the board and team.

The analysis is usually not difficult; it is just not done routinely. What a technology will demand of the market it enters is usually knowable years ahead. Cell and stem cell therapy required a value chain that neither its developers nor their hospital customers possessed, and that was visible throughout the ten year clinical journey before an FDA approval. The failure is not one of analytical capability. It is more often a form of “if we build it, they will come” optimism bias, and it is more pronounced the more innovative and promising the technology is.

A bridge may carry its own risks. It takes management attention from the primary market. It can become the business, with the primary market postponed, as with Botox. It can damage clinical credibility where the bridging market is loosely regulated: unapproved exosome and regenerative products in aesthetics have already drawn FDA warnings. At some point the focus needs to shift back to the primary market.

FOUR

Cell and stem cell therapy example: fund the value chain you will need later

The future of cell and stem cell therapy is not contested. Few people need to be convinced of its clinical value as a therapeutic class. The constraint is that a value chain which does not currently exist must be built from the ground up, at significant cost, by parties who will not see a return on that investment until some considerable time later.

Monoclonal antibodies, for example, took thirty years to reach scale despite using the pre-existing pharmaceutical value chain to a very large extent: one element changed, inside the developer and manufacturer, and external stakeholders did not need to change much to adopt what is now the biggest class of drugs.

A cell therapy originates with the patient rather than a manufacturing facility: the patient's own cells are both the input and the output, and they travel in liquid nitrogen between the two. Cells are collected at the treatment centre, shipped to a central manufacturing site and returned for infusion. The hospital carries apheresis, conditioning chemotherapy, infusion and weeks of inpatient care, with specialist staff and beds few centres have to spare. Manufacturing slots are scarce, and reimbursement runs through a mechanism not yet established. Every element of the value chain changes, and several steps relocate into a hospital setting that has neither the capacity nor the personnel for them.

Casgevy is a functional cure for sickle cell anaemia approved in 2023 and now licensed in 39 countries. It works wonderfully. Roughly 100,000 Americans have the disease and tens of thousands are eligible. In the first fifteen months after approval, less than 100 patients had cells collected. There are 48 authorised treatment centres in the United States and some 65 worldwide, a list price of \$2.2m, and an all-in cost of \$2.5m to \$3.5m once cell conditioning, apheresis, hospitalisation and recovery are counted. Casgevy revenue reached \$76m in the second quarter of 2026, 151% above the same quarter a year earlier. The value chain that delivers it is just starting.

In the first years after the CAR-T approvals in multiple myeloma, a survey of 17 of the 20 certified centres found that only a quarter of eligible patients eventually received the therapy, against a median wait of six months. MD Anderson had around ten eligible patients a month against two manufacturing slots; UCSF had four slots against 50 to 60 eligible patients. Capacity is slowly expanding, with significant capex committed.

In both cases, the technology is not an issue. The lack of a built for purpose value chain at reasonable cost is. What these new technologies would require of hospitals, doctors, payors and manufacturing was knowable years before the approvals.

Potential bridging strategy: attractive markets in wellness, longevity and aesthetics

Where to play. Skin and hair, joints, personalised regeneration, and ophthalmology, where corneal cell therapy is already routine in Japan.

How to win. Clinical credibility a pure play beauty brand cannot buy — physicians, laboratory capability, institutional reputation. High volume recurring revenue rather than low volume therapeutic events. Builds capabilities that are value chain components the therapeutic application will later require.

Botox is among the better-documented examples of consumer and therapeutic market bridging, although the sequence is often remembered differently. It is a neurotoxin that started life as an unsuccessful therapeutic because the purpose-built value chain was not there to support the initial therapeutic application. It now makes more money in its therapeutic indications than it does in its aesthetic applications.

YEAR	WHAT HAPPENED	SCALE
1989	FDA approval for blepharospasm and strabismus	Thousands of patients; commercially immaterial
2002	Botox Cosmetic approved for glabellar lines	Cash-pay, repeat visits, no reimbursement contest. The volume business begins
2010–13	Launch of chronic migraine, then overactive bladder indications	High-burden medical indications, given by neurologists and urologists, building on the safety record and scale of the cosmetic business
2024	~\$2.7bn aesthetics and ~\$3.2bn therapeutic	~11% of AbbVie company revenue across 16+ approved indications

The cosmetic market did not simply exceed the early therapeutic market in revenue. It financed what the later therapeutic indications used: manufacturing at scale, physician familiarity with the agent, a safety database built on high treatment volumes, and the cash flow to fund the clinical programmes. That base was in place when the migraine indication arrived. Therapeutic revenue has since overtaken cosmetic, using the bridge the cosmetic business funded.

Key is that the bridging market has to be worth being in on its own terms. Wellness is a \$6.8tn global economy, with the longevity segment within it growing at roughly 10% a year, paying cash, high margin, with lower entry barriers than therapeutics. Wellness related to retaining performance at age seems particularly interesting for companies with cell and stem cell therapy pipelines, combining demand for high tech personalised solutions with a willingness to pay for them. Operators in Asia have a further advantage — Japan’s quasi-drug category and Korea’s functional cosmetics classification give therapy-like claims a regulatory framework that the United States and Europe do not.

FIVE

AI-derived algorithmic diagnostics example: funding reimbursement activation

The situation for algorithmic blood tests is the mirror image of the cell and stem cell therapy example. Just as with cell and stem cells, the technology is game changing: enabling better and earlier diagnosis for larger populations at lower cost than biopsies or medical device dependent imaging.

These tests largely use the same blood draw, analysers, laboratory and reimbursement path as today’s single biomarkers, so the physical adoption requirement is close to zero. Doctors and patients understand the benefits and advantages. The existing reimbursement value chain is the main cost of

change, and it is a switching cost: a code, a Medicare rate, a coverage review, a payor medical policy and a network contract.

No new infrastructure is required, but a substantial number of existing external stakeholders with decision making rights in existing value chains must agree to change their existing processes and policies to facilitate adoption.

Once algorithm based tests that combine several routine biomarker values into an actionable result are routinely reimbursed, they will move where the value sits in the existing value chain. The individual biomarkers become cost inputs; the algorithmic output becomes the value carrying product. The companies supplying the inputs are no longer the companies supplying the answer.

While that is a very powerful technology promise, nothing will happen or move until the diagnostic businesses developing these tests have navigated three basic steps of the diagnostic value chain. Most innovative test developers plan for and control the first two, and assume the third will follow. The third is the money step. It is the one furthest outside the developer's control, it decides sales and profit, and it is independent of the technology.

	WHAT IT IS	WHO CONTROLS IT TODAY	WHAT HAPPENS WITHOUT IT
Run the sample	Producing the individual biomarker values	Established IVD manufacturers and laboratories	NA – capabilities and outputs are commoditized and ubiquitous
Generate the insight	Combining those values into an actionable results sheet	The test developer. The clinical value is created. The IP sits here	No product. The biomarkers stay commodities and the answer is not yours
Capture the value	Holding the payor relationship and billing for the result	Laboratories and reference networks, not test developers	No business. The value is created by you and collected by somebody else

OVA1 had the insight, the reimbursement and its own laboratory, and still could not capture the value. It has held FDA clearance since 2009 and a Medicare allowable reimbursement rate at a substantial multiple of the sum of its inputs. Until 2014 the test was run and billed by Quest Diagnostics, which collected much of the value. Its owner then moved testing into its own CLIA-certified laboratory and billed payors directly. Volumes and payment still never reached a level that covered the cost of the company: it reported a \$544m accumulated deficit, going-concern doubt and delisting in 2025. The insight was valid, cleared and appropriately priced. A code, a rate and a laboratory were not enough without payor contracts and coverage that turns tests into cash.

GRAIL is missing two. Its Galleri test screens for signals across more than fifty cancers from a single blood draw. Money was not the constraint: roughly \$2bn raised, an \$8bn acquisition by Illumina, and a further \$1bn of capitalisation when European regulators forced the divestment in 2024. Running the sample is expensive: sequencing-based measurement costs hundreds of dollars a sample against tens for an algorithm built on routine blood chemistry. Medicare does not yet cover multi-cancer screening, so there is no capture either. In the second quarter of 2026 GRAIL recorded \$44.7m of revenue on more than 61,000 tests, volume up 35%, at a gross loss of \$12.6m. It still loses money on every test before a single operating expense is counted.

OVA1 had the code, the rate and the laboratory, but not the payor contracts and coverage that turns tests into cash. GRAIL has cost issues in running the sample and has several steps to go before it can capture value through reimbursement. Both have the science. Neither has a business yet.

Capturing the value requires a laboratory that runs the test, the CLIA certification that allows it to bill, active in-system contracts with the payors who will pay it, and a billing organisation that works with payors to establish and expand reimbursement. These are pre-requisites that have to be there before value can be captured in the form of cash from approved reimbursements hitting developer bank accounts. None of this is new, and it has been known for years.

A bridging strategy: low volume higher end traditional diagnostics revenue

Fibronostics, which I led and am still involved with, holds all three. Its primary US product, LIVERFAST, scores fibrosis, inflammatory activity and steatosis from ten routine biomarkers in a single blood draw, and has a reimbursement code. The company also owns the capture layer: a CAP-certified laboratory was acquired that holds enough active payor contracts to provide comprehensive in-network status in most states. The clinical need is not in doubt: roughly a third of US adults have metabolic liver disease, and fibrosis stage is the single strongest predictor of liver-related mortality. The recent approval of therapeutics for F2–F3 fibrosis has made finding and staging those patients a further priority. The market is created by pharmaceutical companies that need screening to find and qualify patients for these therapies.

And it still takes time. Being in network with payors is not the same as being assured of timely reimbursement, a distinction frequently missed at board and investor level. Reimbursement has to be initiated payor by payor, activated inside each organisation's own medical policy process, by people with no economic incentive to do so. That is switching cost in its purest form: nobody refuses, and nothing happens.

Which is why the company built bridges rather than just waiting. It runs a low volume of conventional, well-reimbursed molecular diagnostics testing through the laboratory it already owns — high margin, the same billing infrastructure, the same contracts, the same payors, the same commercial billing team. It is also the pilot for a government-sponsored national screening programme in Asia, which validates the technology and generates clinical evidence at population scale. The combination produces revenue and builds reimbursement and clinical proof points while the primary product goes through the reimbursement activation process. Cash generation and capability build.

Additional potential bridging strategies: partners who will carry the cost

A diagnostic's fundamental value is a cost avoided rather than a benefit experienced, so the natural customer is one that carries the therapeutic cost of healthcare and can provide clinical validation:

- Governments running population screening programmes and large health systems can decide and pay if the socio-economic return is there. Much of this may be outside the United States and carry considerable volume: Singapore, Korea, Japan and the Gulf combine centralised decision-making, national health data sophistication, an economic and demographic reason to act, and the political means to do so.

- Pharmaceutical partnerships to help with therapy eligible patient screening and identification, which pay rapidly and generate evidence; and integrated health systems, which pay slowly but produce high quality reference data in quantity, building capability along the way.
- High end health screening and wellness chains. Here the fee for service is attractive, but the ability to generate clinical validation or reference data may be lacking.

What this means for leaders with innovative technologies

- Consider that innovation means disruption of the status quo, and disruption of the status quo means delay and cost in the adoption of the innovation. The greater the innovation, the greater the disruption is likely to be, and the greater the risk of added time and cost in adoption.
- Analyse what costs of change you will have. Either the value chain is not there and a new one must be built, or it exists and the stakeholders that currently own and run it must change. The first is a capital cost. The second is a time cost.
- Build them into your plan. The failure to plan for them by a leadership team is usually not one of capability but may be an expression of shared optimism bias. That is worth testing and knowing.
- Where the cost of change is significant, a good bridging strategy can do more than fund the bridging of time. It can help build the capabilities and the adoption experience you will need anyway.
- Worked on early and built into the roadmap, it is an offensive move. Discovered late, it is a defensive reaction, and the later the time and cost delay is recognised the more risk you take on.

SEVEN

What boards and executive teams should do

- **Insist that the future value chain is understood, early and in full.** Innovation disrupts the status quo; disrupting the status quo takes time; that time delays adoption and costs money. Each link has to be established before the plan is approved, not assumed. Not whether the technology is good enough, and not the size of the market. Neither predicts adoption.
- **Plan to fund the delay, do not merely note it.** If adoption takes longer, know how you will finance the longer. A slipped milestone costs an apology; an unfunded, foreseen gap costs the company.
- **Judge progress on decisions taken outside the company.** A contract signed, a policy changed, a protocol that names the product, a site qualified and staffed, a buyer reordering. Not another publication, conference or cohort.

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APPENDIX

Principal sources

Cell and stem cell therapy example

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AI derived algorithm diagnostic example

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Source standing varies. Company disclosures, regulatory documents and peer-reviewed work are treated as primary; analyst estimates, trade compilations and rate aggregators are identified as such where they carry weight; sponsored publications are flagged. Figures derived by arithmetic rather than disclosed are marked at the point of use.