

Predicting What Matters

Using Predictive Analytics to Reduce Suffering, Save Lives, and Optimize the Cost of Care

Predictive Analytics for Population Health Management

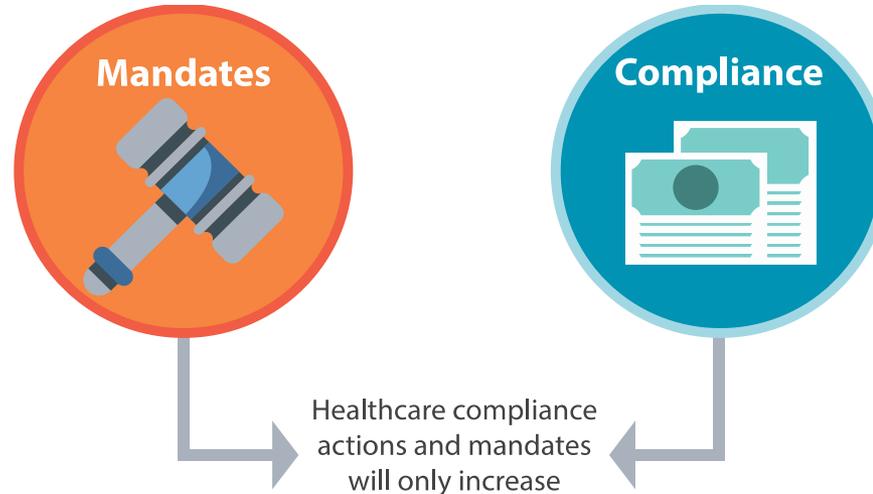
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Learning Objectives

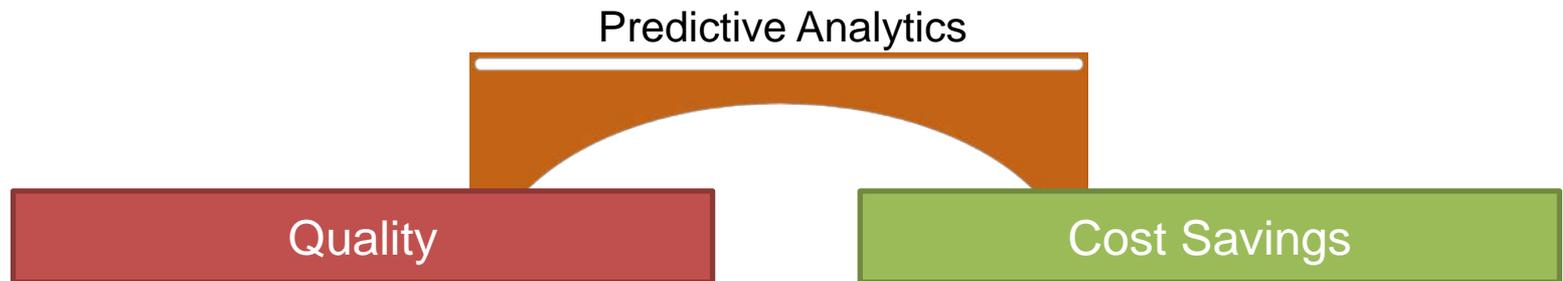
By the end of today's session, you will be able to:

- Define predictive analytics, summarize the types of predictive solutions in the market, and list the key differences between them
- Develop a business case for the adoption of predictive analytics within your own facilities
- List the critical components to driving meaningful and effective results from predictive analytics
- Assess organizational readiness to adopting a predictive analytic solution and develop a high-level engagement plan

Why Healthcare Demands Predictive Analytics

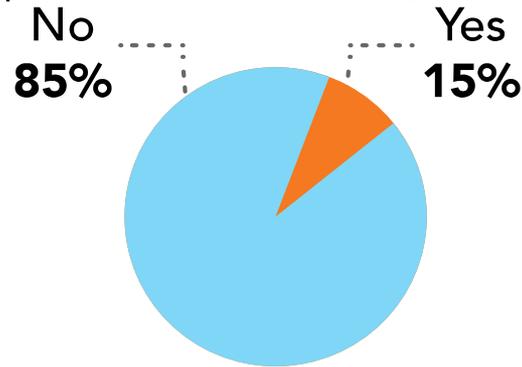


But these initiatives focus on the wrong thing; they look at the *outcome* and not the *root cause* of clinical and financial waste

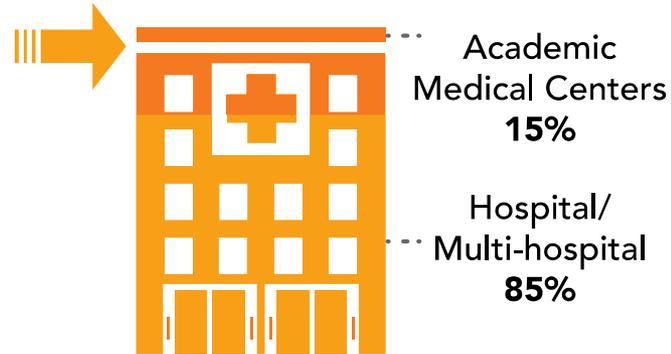


The State of Predictive Analytic Adoption

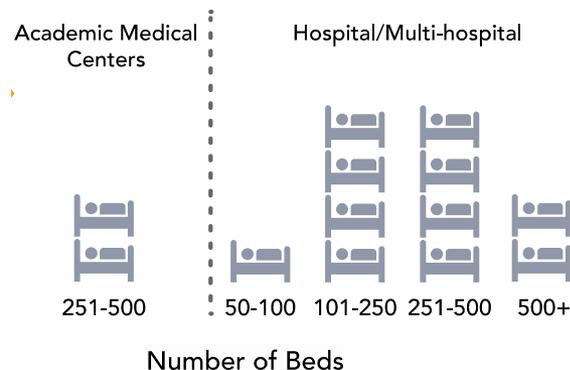
How many providers are using advanced predictive modeling?



Who are the facilities that said "yes?"



What do these facilities look like?



The State of Predictive Analytic Adoption

How are providers applying advanced predictive modeling?

92% are using it to predict patient risk or illness



8% are using it to support other organizational goals



What kinds of solutions are these providers using?



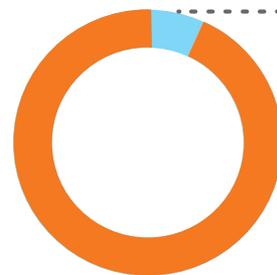
Home-grown Solution

18%

Vendor Solution

82%

Of those who aren't using advanced predictive modeling, would they consider it?



No
4%

Yes/
Unsure
96%

The Hard Dollar Truth

Hip Replacement

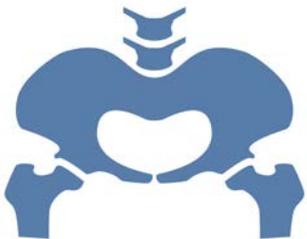


Pressure
Ulcer



13 day stay
\$3K/LOS
\$39,000

Hip Replacement



No Pressure
Ulcer – Patient
Goes Home



10 day stay
\$5K/LOS
\$50,000

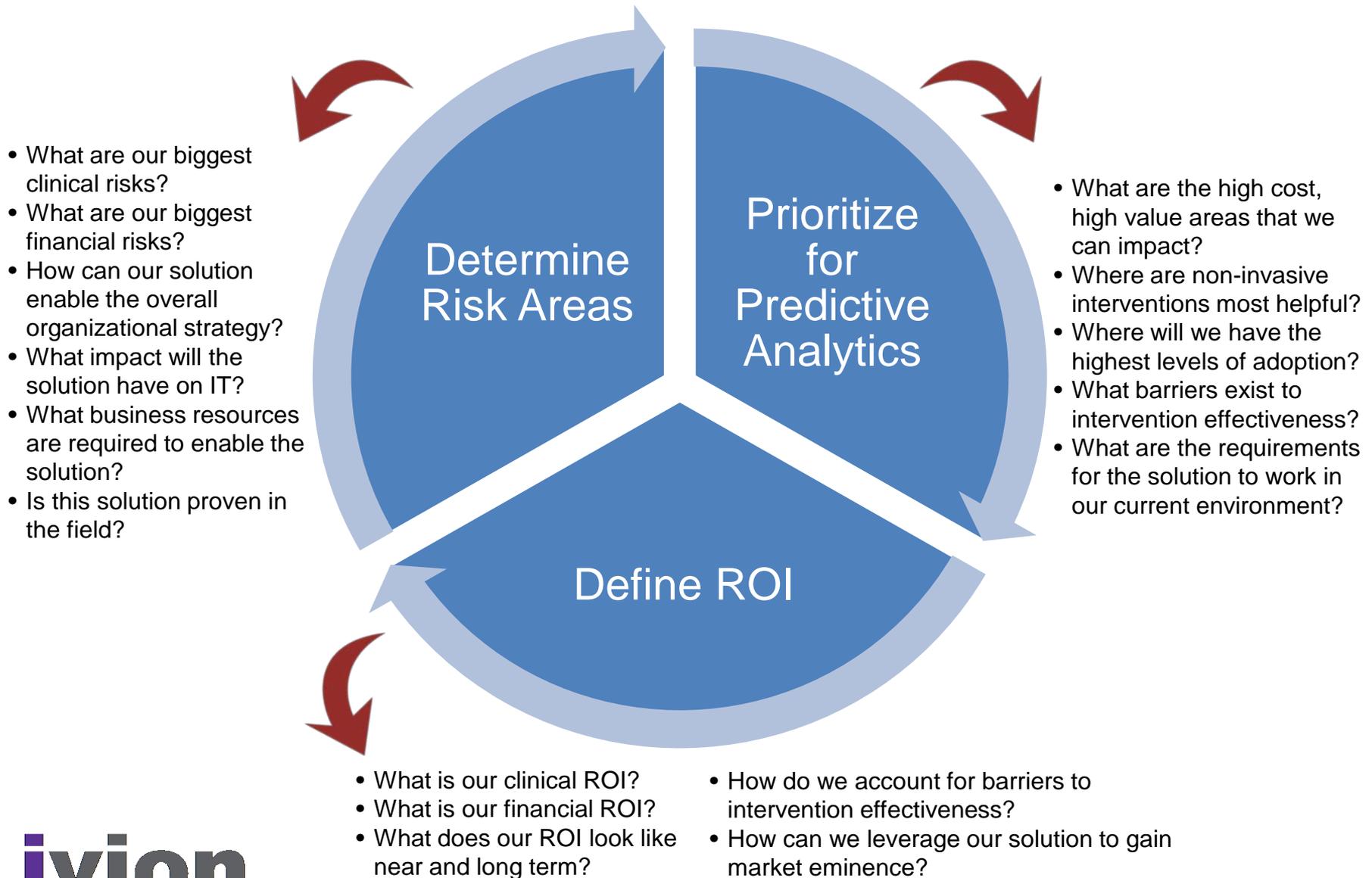


New Patient –
Elective Surgery
(3 day stay; \$7K/LOS)

Total for 13 Days

\$50,000
\$21,000
\$71,000

Steps to Building a Predictive Analytics Business Case



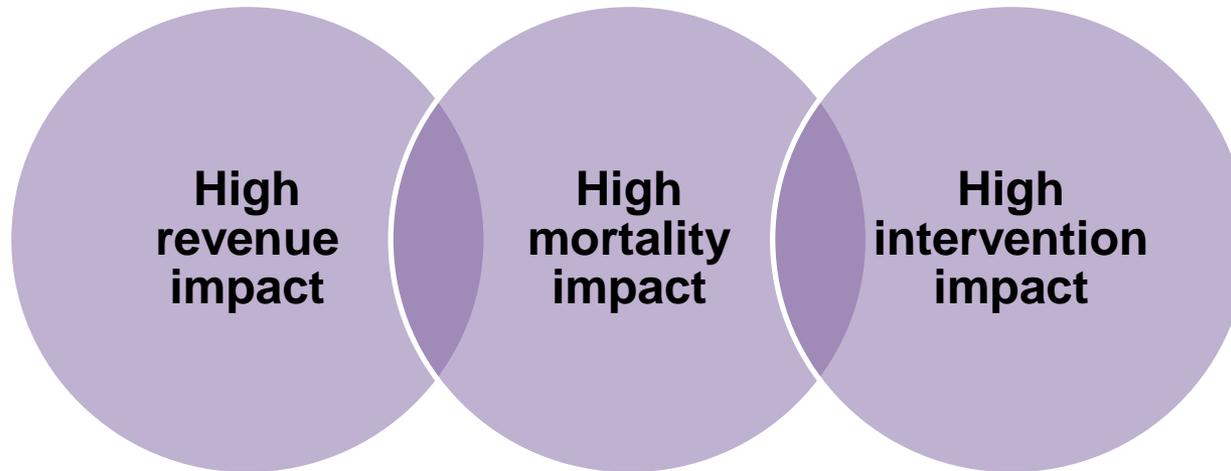
Determining Risk Areas

Current areas of clinical/financial risk

Potential areas of solution risk

Understand current financial and clinical pain points	Determine organizational maturity around value-based models	Assess solution impact to IT resources and infrastructure	Account for functional/clinical resource requirements	Determine solution viability
<p>Including attributable cost and penalties associated with:</p> <ul style="list-style-type: none"> • Hospital acquired conditions • Hospital acquired infections • Readmissions 	<p>Including scores against:</p> <ul style="list-style-type: none"> • Clinical Process of Care Domain • Patient Experience of Care Domain • Outcome Domain • Efficiency Domain 	<ul style="list-style-type: none"> • Infrastructure requirements • Data requirements • Integration options • Proven experience with select EHR(s) 	<ul style="list-style-type: none"> • Model build requirements • Testing requirements • Training requirements 	<ul style="list-style-type: none"> • Accuracy on other data and on your organization's data • Case studies from similar organizations

Prioritizing for Predictive Analytics



Intervention Effectiveness

20%

40%

60%

Pure Potential (100%)

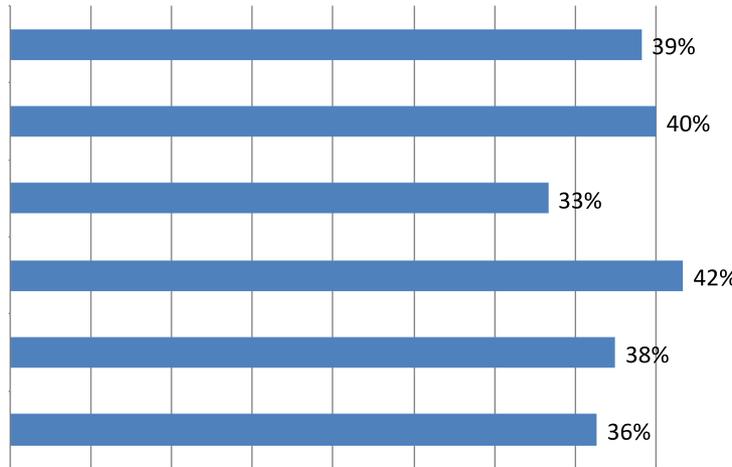
Influenced by:

- Intervention cost of each disease
- Current capacity and cost of additional capacity to perform prevention (case managers, etc.)
- Revenue loss when prevention occurs (if you have no issues filling beds, this should be balanced with incremental revenue when prevention causes beds to turn quicker)
- Slowness to adapt change

Pure potential represents the accuracy of the solution

Defining the ROI

r Readmission Reduction



Projected 5 Year Total Savings

	Medicare	Non-Medicare
AMI	\$1.610M	\$3.221M
COPD	\$2.006M	\$4.011M
HF	\$3.614M	\$7.228M
Hip/Knee	\$0.547M	\$1.094M
PN	\$2.275M	\$4.550M
Cumulative Total	\$10.052M	\$20.104M

Projected 5 Year Medicare Savings

Year	1	2	3	4	5
AMI	\$145,200	\$250,800	\$343,200	\$409,200	\$462,000
COPD	\$174,400	\$316,100	\$425,100	\$512,300	\$577,700
HF	\$312,000	\$559,000	\$767,000	\$923,000	\$1,053,000
Hip/Knee	\$43,200	\$86,400	\$115,200	\$144,000	\$158,400
PN	\$195,000	\$351,000	\$481,000	\$585,000	\$663,000
Yearly total	\$869,800	\$1,563,300	\$2,131,500	\$2,573,500	\$2,914,100

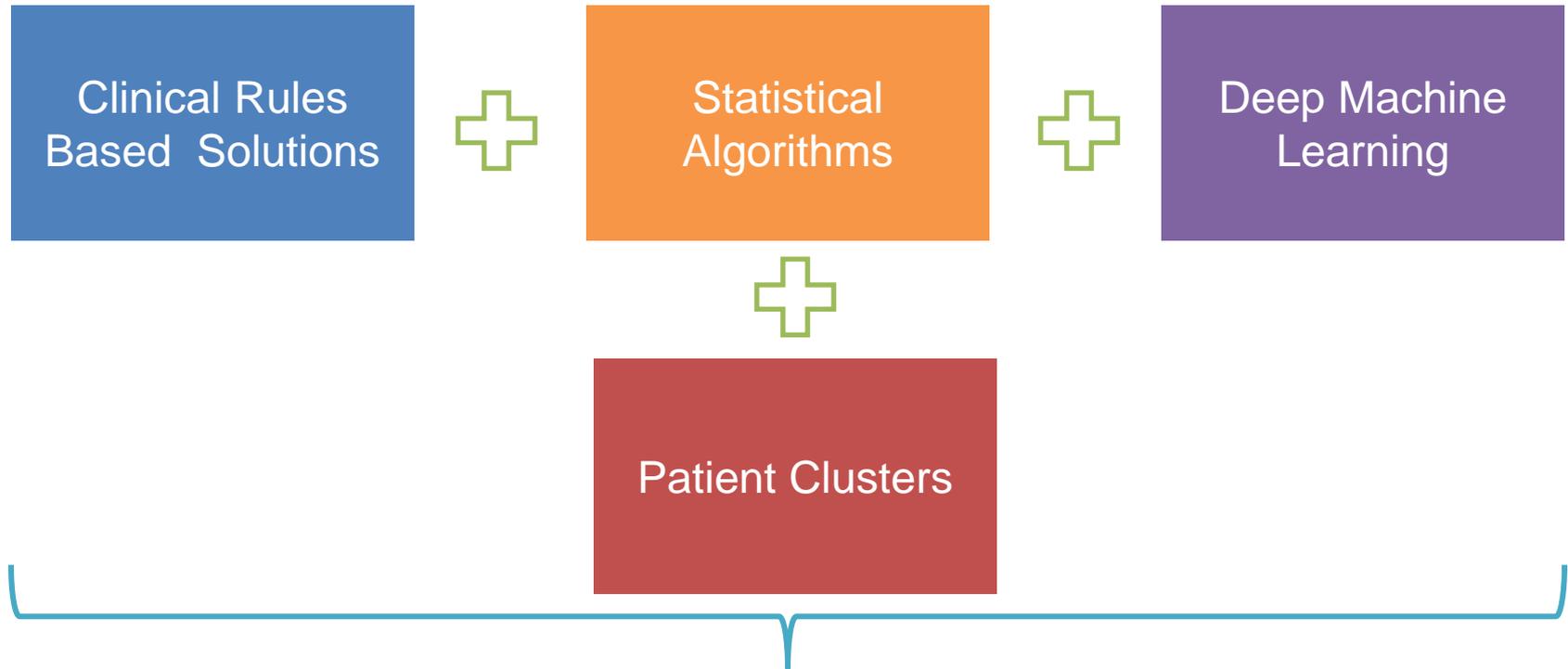
Projected total 5 year savings on readmission prevention using predictive analytics:

\$30.16M

Types of Predictive Analytic Solutions

	Clinical Rules Based Solutions	Statistical Algorithms	Deep Machine Learning
Definition	These solutions compile clinical rules derived from evidence-based clinical studies to identify risk at a defined cohort level	These solutions use statistical algorithms built from evidence-based studies to flag potential risks within a patient population	These solutions use deep machine learning capabilities to identify patient risk. These models are continually refined and more accurate as new data is fed into the system
Examples	Typically integrated into the EHR	LACE scores for 30-day readmissions, Braden scores for pressure ulcers	Predictive analytics companies

Patient Phenotype Approach



Combined capability to understand what isn't inherently visible with clinical intelligence to more accurately identify, map, and predict patient-level risk

What This Means for Population Health

Proactively Understand Population Risk

Programs that most effectively diminish burden

Patients most likely to engage

Prioritization based on risk

Identification of intervene-able risk

ROI and yield tracking

Build vs. Buy

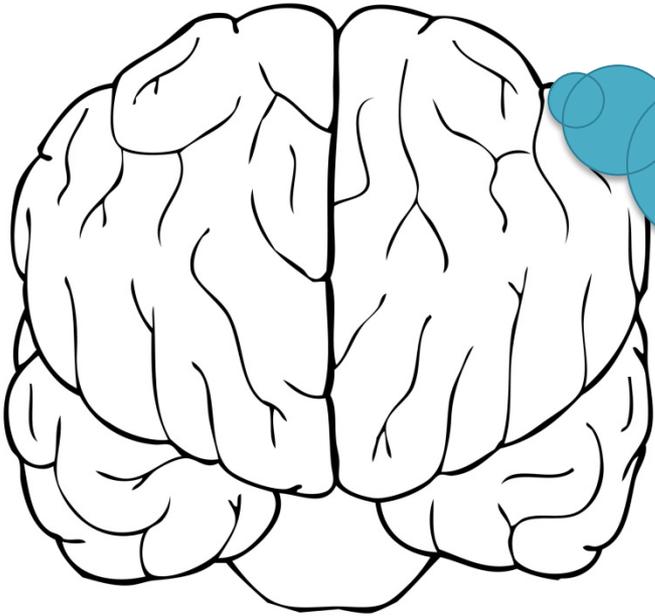
	Build	Buy
Resources	<ul style="list-style-type: none"> • Data Scientist • Infrastructure • Data • Statisticians • Testing Resources 	<ul style="list-style-type: none"> • Limited IT involvement • Data Scientists can be leveraged for other projects
Time	1-2 years	6-10 weeks
Capabilities	1-2 use cases	Dozens of pre-seeded use cases
Risks	<ul style="list-style-type: none"> • Investment may not yield predictive capabilities at target accuracy levels • Resource constraints may extend timelines • Adoption and change management challenges 	Adoption and change management challenges still exist but can be mitigated through solution demos and ROI measures

What Actually Works in A Hospital



Getting Our People Engaged

Clinician adoption is critical to our success. Our solution had to:

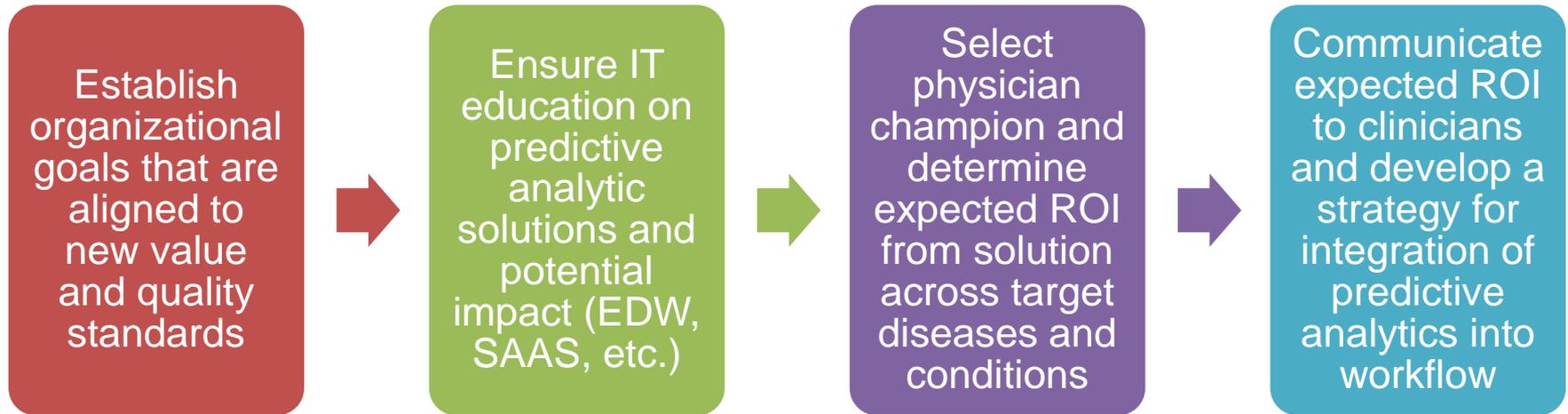


- Easily fit into the clinician's workflow
- Demonstrate immediate accuracy and effectiveness
- Be proven and hold up to scrutiny
- Be easy to use and understand
- Be accepted by fellow clinicians

Is My Organization Ready?

Strategy	Technology	Leadership	Clinicians
<ul style="list-style-type: none">• Alignment to value-based and at-risk models• Established goals focused on quality and population health outcomes• Appointment of a CMIO/CHIO	<ul style="list-style-type: none">• Understanding of predictive analytic applications• IT support for adoption	<ul style="list-style-type: none">• Presence of a physician champion• C-suite alignment across all functions• Established goals that can be enabled through predictive analytics	<ul style="list-style-type: none">• Established network of peer groups that enable adoption of new solutions• Understanding of clinical predictive analytic application• Understanding of how clinical predictive analytics fit into the workflow

What Are My Next Steps?



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Q&A