Designing for Accelerated Translation (DART) of emerging innovations in health

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March 8, 2022
17 years for 14% of research discoveries to be integrated into practice

Balas & Boren. in van Bemmel & McCray, Yearbook of Medical Informatics. 2000

Pathman et al. Med Care. 1996.
Things may get worse

- Healthcare is increasingly multilevel
  - Barriers at the patient, provider, health care system, and policy levels

- Healthcare is increasingly burdened
  - Pragmatic research on chopping block if not aligned with real-world problems and routine workflows

Things may get better

- **Rapid Cycle Research** – momentum toward timely, contextually-informed innovation (recent NCI workshop, etc)

- Rapid iterative processes to address pragmatic problems, resulting in “better care faster” (Johnson et al., 2015)

- “...implementation cannot be left as a post hoc procedure.” (Mohr, Riper, Schueller. JAMA Psychiatry 2018)
What is the minimum level of evidence needed for implementation?

When can we begin acting on the evidence, even as it rapidly evolves?

These are the questions we’re asking in our mHealth and genomics work!

How can implementation science inform this work at an earlier stage?

“Lots to unpack here – let’s write a paper”
Merging implementation science with biomarker research

- **When is a genomic biomarker ready for implementation?**
  - Examine the chain of evidence (CDC, 2009)
    - Analytic validity – Reliability of biomarker test
    - Clinical validity – Strength of association
    - Clinical utility – improve care, health behavior, perceived benefit

- **Typical Approach**: Demonstrate utility, then consider implementation issues

- **Proposed Approach**: Assess implementation context *alongside* clinical utility

What’s behind the idea of DART?

<table>
<thead>
<tr>
<th>Key Premise #1</th>
<th>Translation of evidence to practice is unnecessarily slow.</th>
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</thead>
<tbody>
<tr>
<td><strong>Hot-Take #1</strong></td>
<td>D&amp;I research should not be viewed merely as a final step in the translational process.</td>
</tr>
<tr>
<td><strong>Hot-Take #2</strong></td>
<td>Without radically different approaches to accelerating translation, diffusion of evidence to practice will remain slow.</td>
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</table>

<table>
<thead>
<tr>
<th>Key Premise #2</th>
<th>Translation of evidence to practice is a dynamic process.</th>
</tr>
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<tbody>
<tr>
<td><strong>Hot-Take #3</strong></td>
<td>Researchers are responsible for considering implementation needs “early and often”.</td>
</tr>
<tr>
<td><strong>Hot-Take #4</strong></td>
<td>All health research should aim to address an actual problem or need.</td>
</tr>
<tr>
<td><strong>Hot-Take #5</strong></td>
<td>Much evidence can be acted upon even when uncertainty of effectiveness is moderately high, recognizing that this evidence is evolving and subject to frequent reevaluation.</td>
</tr>
</tbody>
</table>
Is evidence of effectiveness all that matters? What else informs an innovation’s readiness for implementation?

**Pace** of implementation \((P)\) is a function of:

- **strength of evidence** \((E)\) – effectiveness, utility
- **demand** \((D)\) – urgency, existing alternatives, stakeholder pull
- **risk** \((R)\) – potential clinical harms, risk from *not acting* on available evidence
- **cost** \((C)\) – financial expense, resource intensiveness, disruptive effects

\[
P = f\left(\frac{(E \times D)}{(R + C)}\right)
\]
Guide to assessing and accelerating implementation readiness

<table>
<thead>
<tr>
<th>Evidence</th>
<th>Demand</th>
<th>Risk</th>
<th>Cost</th>
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</table>

### Application to a precision medicine innovation: Genetics of smoking (CHRNA5 variants)

<table>
<thead>
<tr>
<th>Evidence</th>
<th>Demand</th>
<th>Risk</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
<td>Decreasing</td>
</tr>
<tr>
<td>Strong Analytic and Clinical Validity</td>
<td>&gt; 2 million people genotyped for direct-to-consumer genetic testing</td>
<td>After receiving genetic results: Never smokers do not start smoking Former smokers do not relapse No increase in anxiety or depression No decision regret</td>
<td>Genome array is &lt; $200 Sequencing is &lt; $1000 Single test with durable and broadly-applicable results</td>
</tr>
<tr>
<td>Clinical Utility needed</td>
<td>&gt; 90% current smokers wanted genetic results to guide smoking cessation</td>
<td></td>
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</tbody>
</table>

Hancock et al 2018 Curr Psychiatry Rep
Ramsey et al 2018 Transl Beh Med
Yamamoto et al 2017 J Hum Genet
Ramsey et al 2020 Cancer Prev Res
Lipkus et al 2015 Nicotine Tob Res
Hartz et al 2015 Genet Med
Olfson et al 2016 Nicotine Tob Res
EMR and Genomics (eMERGE) Network
Implementing Genomics in Practice (IGNITE) Network

Accelerating (or optimizing the pace, if you like) implementation using DART

The DART Framework
Designing for Accelerated Translation

# DART strategies to move things further, faster

<table>
<thead>
<tr>
<th>Meaningful Stakeholder Partnership</th>
<th>Current State: “Where We Are”</th>
<th>Optimal State: “Where We Want to Be”</th>
<th>Implementation or Improvement Strategies: “What It Will Take”</th>
</tr>
</thead>
<tbody>
<tr>
<td>Research siloes</td>
<td>Team science</td>
<td>Develop partnerships early on across translational spectrum</td>
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<tr>
<td>Restrictive samples</td>
<td>Citizen science</td>
<td>Harness power of public for scientific activities</td>
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<tr>
<td>Disconnected from industry</td>
<td>Partnering with industry</td>
<td>Partner with those primed to bring innovations to market</td>
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</tr>
<tr>
<td>Design Innovations for D&amp;I</td>
<td>Pushing out innovations</td>
<td>Understand user motives and context; demonstrate value add</td>
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<tr>
<td></td>
<td>Eliciting / meeting user demand</td>
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<td></td>
<td>Researcher-driven</td>
<td>Involve diverse group of end-users throughout development</td>
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<td></td>
<td>Human-centered design</td>
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<tr>
<td></td>
<td>Efficacy over effectiveness</td>
<td>Better packaging of evidence for translation to practice / policy</td>
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<tr>
<td></td>
<td>Robust, context-sensitive innovations</td>
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</tr>
<tr>
<td>Learning Healthcare System</td>
<td>Narrow use of evidence</td>
<td>Use existing data, rapid reviews, and Create-Trial-Sustain models</td>
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<tr>
<td></td>
<td>Ongoing / efficient evidence review</td>
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<td></td>
<td>Static delivery systems</td>
<td>Give real-time feedback on key outcomes to providers</td>
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<td></td>
<td>Using iterative feedback</td>
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<td></td>
<td>Resistant to change</td>
<td>Train workforce in core concepts that apply across technologies</td>
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<td></td>
<td>Nimble, change-oriented mindset</td>
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</tbody>
</table>
Synergies between implementation science, learning health care systems, and precision medicine

Key Areas of Synergy
- Evolution of evidence base for precision medicine and implementation science
- Recognition of underuse and overuse of interventions
- Management of abundance of data

Optimal integration of effective diagnosis, prevention, and treatment
- Understanding of multilevel context
- Theories and strategies to drive health care improvement

Key Areas of Synergy
- Support for implementation of effective practices
- Contextually sensitive improvement of practices

Improved health, health care, and health systems

Key Areas of Synergy
- Refresh cycle of evidence base
- Determination of degree of achievable personalization of care

Optimal use of genomics and behavioral data to drive clinical and patient decision making
- Ongoing development of genomics evidence base
- Personalized and population impact

Use of ongoing data to drive health system improvement
- Focus on iterative and ongoing learning
- All stakeholders participate

Chambers, Feero, Khoury. JAMA 2016
The Path for Precision Medicine


Applying genetics and genomics as tools to optimize behavioral interventions (McCaffery 2019)  

Using known predictors of behavior, such as genetic predisposition, biology, environment, and past behavior to enhance treatment (Stump et al 2019)
Applying genetics and genomics as tools to optimize behavioral interventions (McCaffery 2019)

Using known predictors of behavior, such as genetic predisposition, biology, environment, and past behavior to enhance treatment (Stump et al 2019)
From Genomic Discovery to Genetically-Informed Behavioral Interventions

NIH Stage Model for Behavioral Intervention Development

Genetics of Smoking: Bridging the Past, Present, and Future

Stage 0: Basic Science

Stage I: Intervention Generation/Refinement

Stage II-V: Efficacy to Implementation

Genomic Discovery

Development and Proof-of-Concept Testing

Real-World Clinical Utility
Genetics of Smoking: Bridging the Past, Present, and Future

Stage 0: Basic Science

Genomic Discovery

Laura J. Bierut, MD
Alumni Endowed Professor of Psychiatry

Li-Shiun Chen, MD, ScD, MPH
Associate Professor of Psychiatry

Washington University School of Medicine in St. Louis
Department of Psychiatry
Prognostic significance of \textit{CHRNA5} gene region

There is now evidence that variants in and near this gene have prognostic significance for:

- risk of smoking-related diseases
- likelihood of smoking cessation
- response to nicotine replacement therapy

Individuals with high-risk genetic variants:

- smoke more heavily
- have 2-fold increased risk for lung cancer
- develop lung cancer 4 years earlier
- quit smoking 4 years later
- have lower success with unassisted quit attempts

\textbf{GSCAN Consortium.}, 2019
Genetics of Smoking: Bridging the Past, Present, and Future

Stage 0: Basic Science  Stage I: Intervention Generation/Refinement

Genomic Discovery

Development and Proof-of-Concept Testing

How do my genes and smoking impact my risk for...

- Lung Cancer
- Lung Disease
- Difficulty Quitting Smoking

Acceptable  Understood

80%  90%

Department of Psychiatry

Washington University School of Medicine in St. Louis
Iterative Design and Development

Proof-of-Concept Testing

High demand for smoking-related genetics (N=111 participants who smoke)

Evolving design toward the “Genetics and Smoking RiskProfile”

Iterative design and prototyping of RiskProfile

**Introduction**

- Your Genetics and Smoking Risk Profile

**Brief Orientation**

- Chromosome 15 region of your DNA is known to be very important in determining your genetic risk of developing smoking-related diseases and having difficulty quitting smoking.

**Personalized Genetics, Risk Categorization, Interpretation and Framing**

**How do my genes and smoking impact my risk for...**

- **Lung Cancer?**
- **Lung Disease?**
- **Difficulty Quitting Smoking?**

**Your Genetics:**

- Genetic Marker: rs1466948
  - Location: Chromosome 15
  - Possible Variants: C or A
  - Risk Variant: A
  - Your Genotype: A

- Genetic Marker: rs1466922
  - Location: Chromosome 15
  - Possible Variants: C or A
  - Risk Variant: A
  - Your Genotype: A

- Genetic Marker: rs1466948
  - Location: Chromosome 15
  - Possible Variants: A or G
  - Risk Variant: G
  - Your Genotype: G

**What This Means:**

Based on a combination of your genetic risk and how much you smoke, you are:

- At very high risk for:
  - Lung Cancer – Because of this risk, it is critically important for you to quit or reduce smoking.
  - Lung Disease/COPD – This increases the chance of developing lung cancer and causes faster loss of lung function in smokers.
  - Difficulty Quitting Smoking – Medications will be very important in helping you to quit long term.

**There Is Good News!** Those with your genetic makeup:

- Greatly reduce the onset of lung cancer by quitting smoking
- Benefit especially from smoking cessation medications

**Quit Advice and Resources**

**WHAT TO DO:**

- 24/7 Support and Info on Meds
  - Call 1-800-QUIT-NOW
  - Visit www.smokingcessation.gov
  - Text "SMOKE" to 47848
  - Activities include: 3 apps, 4 videos, 7 month plan, 6 week kit, 12 week event

1. quitting smoking is one of the best things you can do to reduce your risk of lung cancer and COPD.
2. with your very high risk of smoking-related disease, we recommend medications to help you quit smoking and decrease your risk.

Participatory Design of a Personalized Genetic Risk Tool to Promote Behavioral Health
Alex T. Ramsey¹, Michael Bray¹, Penina Acayo Laker², Jessica L. Bourdon¹, Amelia Dorsey¹, Maia Zalik¹, Amanda Pietka¹, Patricia Salyer¹, Erika A. Waters³, Li-Shiun Chen¹, and Laura J. Bierut¹

Proof-of-Concept Testing
RiskProfile was acceptable and well-understood

- Acceptability of Intervention
  - 83% of participants rated the intervention as highly acceptable

- Decision Regret
  - 99% of participants affirmed that they would make the same decision again to receive RiskProfile

- Comprehension and Recall of Results
  - Over 90% at follow-up reported understanding RiskProfile moderately to extremely well

- Perceived Intervention Utility
  - 91% found the tool useful-to-extremely useful overall

N=108 participants who smoke
58% White, 34% Black, 7% Other
35% High school diploma or less

Reduced smoking after receiving RiskProfile (n=108)

Smoking-related behavior change by *RiskProfile* status (n=108)

No clear differences by risk level

Genetics of Smoking: Bridging the Past, Present, and Future

Stage 0: Basic Science

Stage I: Intervention Generation/Refinement

Stage II-V: Efficacy to Implementation
Learning simultaneously across the (iterative) research pipeline

Are genetically-informed interventions for smoking ready to proceed to:

- Next stage of innovation development? **YES**
  - Developing/refining polygenic risk scores
  - Studying behavior change mechanisms

- Clinical trial testing? **YES**
  - RCT with active control and longer-term follow-up
  - Establishing effect sizes

- Implementation research? **YES**
  - Hybrid Type 1 studies: Gather info on implementation context
  - Understand multi-level barriers, facilitators, acceptability, feasibility
  - Adapt for telehealth, behavioral health, lung cancer screening, and primary care settings
Fully-Remote Parallel-Group RCT (current NIDA R34)

Control = Brief Cessation Advice
Intervention = Brief Advice + RiskProfile

YOUR RISK FROM SMOKING
Your genetics don't change, but you CAN reduce your smoking to reduce your risk.

- You said that you smoke 20 cigarettes per day.
  - This puts you in the Heavy Smoker category.
- From your smoking behaviors alone, you are at very high risk for smoking-related disease.

YOUR RISK FROM GENETICS
Here is your personalized risk information, based on your genetics.

- Genetic Marker: rs18003988
- Location: Chromosome 15
- Possible Variants: G or A
- Risk Variant: A
- Your Genotypes: G/A

From your genetics alone, you are at high risk for smoking-related disease.

Next we'll look to see what level of smoking tells us about this risk.

HOW DO MY GENETICS AND SMOKING IMPACT MY RISK FOR:

- Lung Cancer?
- Lung Disease?
- Difficulty Quitting Smoking?

Based on a combination of your genetic risk and how much you smoke, you are at very high risk for:

- Lung Cancer
  - Because of this risk, it is really important for you to quit or reduce smoking
- Lung Disease/Chronic Obstructive Pulmonary Disease (COPD)
  - This raises the chance of getting lung cancer and causes faster loss of lung function in smokers
- Difficulty Quitting Smoking
  - Medications will be very important in helping you to quit long-term
Early results suggest decrease in smoking after RiskProfile (n=61)
Aim:
To test the impact of a personalized risk feedback tool on *physician ordering* and *patient receipt* of lung cancer screening and smoking cessation treatment.

Goal:
To improve primary and secondary prevention of smoking-related lung cancer.

Approach:
Comparing 3 Arms

<table>
<thead>
<tr>
<th>Arm</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arm 1: Usual Care</td>
<td>Standard of care, brief advice, and guideline awareness</td>
</tr>
<tr>
<td>Arm 2: RiskProfile-Clin</td>
<td>Multilevel intervention based on clinical factors only</td>
</tr>
<tr>
<td>Arm 3: RiskProfile-Gen</td>
<td>Multilevel intervention based on clinical and genetic factors</td>
</tr>
</tbody>
</table>
3-arm cluster RCT comparing usual care to multilevel precision health intervention, with and without genetics

**Usual Care:** Screening and treatment recommendation as usual, with USPSTF guideline awareness

**RiskProfile-Clin:** Risk feedback based on demographic and clinical factors alone using established PLCOm2012 model

**RiskProfile-Gen:** Risk feedback based on clinical (PLCOm2012) plus genetic factors (ancestry-specific polygenic risk scores)
Digital intervention to reduce self-stigma among pregnant and postpartum women with opioid use disorder (pending NIDA SBIR)

Phase 1 (1 year)
Discover, Design/Build, Test (DDBT) Framework

- Identify different needs of the PPW with OUD
- Understand unadapted *Enhearten* and its context
- Clarify usability issues & barriers to implementation

- Iterative testing to refine synthesized concepts
- Evaluate the responsiveness of the adaptation process in enhancing fit of *Enhearten*
- Understand end-user experience with *Enhearten*
- Refine *Enhearten* to demonstrate face validity, acceptability, and engagement

- Trial out the adapted *Enhearten* through beta testing
- Evaluate the usability & likely effect of *Enhearten* on reducing self-stigma

| Discover modification target | Redesign/Adapt *Enhearten* | Evaluate the preliminary impact of *Enhearten* |

Phase 2 (2 years)
Additional DDBT
then
RCT to test adapted digital intervention

Washington University School of Medicine in St. Louis
Need for Translational Speed (with appropriate guardrails)

**Methodological Gap:**
Systematically measuring and reporting on the pace of research translation and understanding the influences on and impact of implementation speed

**The Why**
- Grant mechanisms
- Global pandemics
- Healthcare inequities

**Speed Bumps/Yield**
- Do no harm
- Pushback
- Jeopardize sustainability?
- Risk further inequities?

**Tools**
- Hybrid designs
- User-centered designs
- Rapid ethnography
- Market viability assessment

**Guidance**
- Align with local needs
- Move at speed of trust (earned)
- Measure and report on speed!!!

Proctor, Ramsey, et al, under review
### Stakeholder perspectives and selected priorities on the speed of research translation

<table>
<thead>
<tr>
<th>Stakeholders</th>
<th>Perspectives and priorities (sample questions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention developers, trainers, and purveyors</td>
<td>How long until the innovation is adopted?</td>
</tr>
<tr>
<td>Clinicians</td>
<td>How long will the innovation take to learn? How long to reach competence? When can the innovation be used?</td>
</tr>
<tr>
<td>Clients and patients</td>
<td>How long until the innovation is available? How long until improvement is seen?</td>
</tr>
<tr>
<td>Administrators</td>
<td>How long is the change process?</td>
</tr>
<tr>
<td></td>
<td>How quickly will new innovation become routine?</td>
</tr>
<tr>
<td>Payers</td>
<td>How long until return on investment?</td>
</tr>
<tr>
<td>Policy makers</td>
<td>How do current or proposed policies affect the speed of research translation?</td>
</tr>
<tr>
<td>Communities</td>
<td>How long until users of the innovation are reached? How long until coverage rates are adequate?</td>
</tr>
<tr>
<td>Advocates</td>
<td>Does rapid research affect health equity?</td>
</tr>
<tr>
<td></td>
<td>How long until equity is realized?</td>
</tr>
<tr>
<td>Researchers (<em>Current</em>)</td>
<td>How long does it take to translate evidence to practice?</td>
</tr>
<tr>
<td>Researchers (<em>Proposed</em>)</td>
<td>How long will each stage of research translation take for this innovation?</td>
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<tr>
<td></td>
<td>How can we better measure the speed of change?</td>
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<tr>
<td></td>
<td>What factors will impact speed?</td>
</tr>
<tr>
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<td>What strategies will enhance speed?</td>
</tr>
<tr>
<td></td>
<td>How do we increase speed for disadvantaged groups?</td>
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<td></td>
<td>What effects did speed at both the translational research and applied implementation levels have on overall impact of the innovation?</td>
</tr>
</tbody>
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Speed... in reference to what?

<table>
<thead>
<tr>
<th>Potential referents of speed</th>
<th>Examples</th>
</tr>
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<tbody>
<tr>
<td><strong>Speed of what?</strong></td>
<td></td>
</tr>
<tr>
<td>Completing phases of the implementation process</td>
<td>Once we complete the readiness planning stage, how soon do we begin hiring and training the staff needed for implementation?</td>
</tr>
<tr>
<td>Attaining implementation outcomes</td>
<td>How quickly can we achieve 50% screening uptake by physicians?</td>
</tr>
<tr>
<td>Achieving service system outcomes</td>
<td>How long will it take for us to increase patient-centeredness reports by 20%?</td>
</tr>
<tr>
<td>Attaining clinical and population-level outcomes</td>
<td>How quickly can society reach herd immunity via vaccine rollout?</td>
</tr>
</tbody>
</table>

Proctor, Ramsey, et al, under review
# Speed... how do we measure it?

## Measurement of Speed

<table>
<thead>
<tr>
<th>Domains for Measuring Speed</th>
<th>Example Metrics</th>
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<tbody>
<tr>
<td><strong>Speed in the Implementation Process</strong></td>
<td></td>
</tr>
<tr>
<td>Time elapsed to achieve predefined implementation milestone</td>
<td>Number of days from starting provider training to first person receiving the intervention</td>
</tr>
<tr>
<td>Time elapsed to attain predefined outcome (implementation,</td>
<td>Number of months to attain 60% of eligible providers delivering the intervention following clinic adoption</td>
</tr>
<tr>
<td>service system, clinical outcomes)</td>
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</tr>
<tr>
<td>Implementation progress between predefined time periods</td>
<td>Number of implementation steps completed or outcomes attained in 6 months</td>
</tr>
<tr>
<td>Rate of progress (or changes in slope) over time or between</td>
<td>% increase in sites adopted in first 6-month period vs. second 6-month period</td>
</tr>
<tr>
<td>milestones</td>
<td>Visual depiction (i.e., curve) of % increase in providers engaged 6 months prior to readiness assessment vs. 6 months subsequent to readiness assessment</td>
</tr>
<tr>
<td>Pace of iterative development or improvement</td>
<td>Time elapsed (in days) from start to end of 1st PDSA cycle, 2nd PDSA cycle</td>
</tr>
<tr>
<td><strong>Speed in the Translation of Research</strong></td>
<td></td>
</tr>
<tr>
<td>Time spent within a translational stage (and time saved in</td>
<td>Number of months to develop first versus second iterations of intervention</td>
</tr>
<tr>
<td>subsequent iterations within the translational stage)</td>
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<tr>
<td>Time to advance from one translational stage to another</td>
<td>Number of months from intervention development to efficacy testing in real-world settings (e.g., from Stage I to Stage III in NIH Stage Model for Behavioral Intervention Development)</td>
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</tbody>
</table>

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Can we expedite the 17-year odyssey?
Framework to Assess Speed of Translation (FAST)
Determinants of implementation pace

Accelerators
Innovation factors: Demand/"pull", Evidence strength, Funding, Scalability of innovation
Adopter factors: Need/urgency (risk of inaction), Implementation capacity
Strategies: Policy mandates, Financing, Partnership building, Designing innovations for D&I

Parameters of Speed
Perspective: speed in reference to "what" or "whom" (intervention components, provider uptake, agency spread, population reach)
Endpoints: speed from "when to when" (time from awareness of EBT to decision to adopt, to fidelity, to first patient treated, to scale-up)
Determinants and Strategies: "how" speed is built

Inhibitors
Innovation factors: Actual risk of harm, Costs
Adopter factors: Risk aversion, lack of experience, staff turnover
Strategies: Mismatched strategies

Leaks/Inefficiencies
Turnover
Lack of: measurement feedback, ongoing training, fidelity monitoring
Misaligned changes in policy/reimbursement

Rate of Flow Factors
Receptive audiences / end-users
Meaningful stakeholder partnerships
Industry/Public-private
Community engagement
Learning health system
Iterative cycles to test/adapt
Timely/relevant feedback
Dynamic adaptation/sustainment

Effects of Speed
Faster attainment of desired outcomes:
- Implementation outcomes
- Service outcomes
- Clinical outcomes
- Population-level outcomes
- Health equity
Faster completion of implementation phases
Need heightened attention to protect against potential risk of clinical harms or disruption

↑ Relevance of innovation
↑ Stakeholder engagement
↓ Implementation barriers (secular changes)
↓ Time until public health impact

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Key Take-Aways

- DART can serve as guide to assess and accelerate implementation readiness.
- Evaluate and address factors beyond efficacy/effectiveness – demand, risk ratio, costs – to accelerate.
- When possible, learn and advance science simultaneously along the translational research pipeline.
- Genomically-informed and technology-based interventions are excellent, multidisciplinary test beds.
- Measure and report on implementation speed – an underexplored area.
- Designing for D&I, meaningful partnerships, and learning health systems can help us go further, faster.
Acknowledgments

Enola Proctor
Laura Bierut
Li-Shiun Chen
Sherri Fisher
Tricia Salyer
Thue Rammaha
Amelia Dorsey
Maia Zalik
Amanda Pietka
Michael Bray
Jessica Bourdon
Penina Acayo Laker
Erika Waters
Timothy Baker
Marcus Munafo
Jingling Chen
Yoonhoo Chang
Eric Lenze
Ginger Nicol
Patty Cavazos-Rehg
Sarah Hartz
Carrie Mintz
Rob Culverhouse
Nancy Saccone
Nina Smock
Mary Politi
Anne Stilinovic
David Gierada
Mark McGovern
Matthew Kreuter
Elvin Geng
Ken Freedland
Jane Garbutt
Sara Malone
William Powderly
David Chambers
Ross Brownson
Lisa Saldana
Thomas Maddox

Research supported by NIDA (K12DA041449 and R34DA052928) and NCI (P50CA244431).
Thank You!

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