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SCIENCE MEDICINES HEALTH

# Accelerating innovation through partnerships: the NEWDIGS example

Washington, IOM, Feb 2013
Hans-Georg Eichler

# In this talk

- NEWDIGS: an effective partnership
- What is Adaptive Licensing (AL)?
- What types of studies / evidence generation is needed in future?

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Welcome to NEWDIGS

# NEWDIGS: New Drug Development ParadIGmS

Applying MIT systems expertise to transform healthcare innovation

# Current State: "Pharmageddon!"

**PATIENTS**
Urgent unmet medical needs

**REGULATORS**
Competing demands: innovation & safety

Reliably & sustainably deliver new, better, affordable drugs to the right patients faster.

**PHARMAS**
Unsustainable cost of innovation

**PAYORS**
Skyrocketing costs

**PROVIDERS**
Need better benefit/risk information

# New Drug Development Paradigms (NEWDIGS)

- Unique collaborative innovation and learning environment
  - » Creative & unbureaucratic (Skunkworks)
  - » Collaborative impact (Sematech)
  - » Entrepreneurship & collective intelligence (MIT)
- Systems approach to catalyzing change: Co-evolution of processes, technologies, policies, and people
- Strategic coordination between real world pilot projects and academic research in engineering, science, and management

# NEWDIGS Collaborators

- Collaborators include individuals from:

STATE OF THE ART

nature publishing group

Open

See COMMENTARY page 378

# Adaptive Licensing: Taking the Next Step in the Evolution of Drug Approval

H-G Eichler[1,2], K Oye[2,3,4], LG Baird[2], E Abadie[5], J Brown[6], CL Drum[2], J Ferguson[7], S Garner[8,9], P Honig[10], M Hukkelhoven[11], JCW Lim[12], R Lim[13], MM Lumpkin[14], G Neil[15], B O'Rourke[16], E Pezalla[17], D Shoda[18], V Seyfert-Margolis[14], EV Sigal[19], J Sobotka[20], D Tan[12], TF Unger[18] and G Hirsch[2]

**Traditional drug licensing approaches are based on binary decisions. At the moment of licensing, an experimental therapy is presumptively transformed into a fully vetted, safe, efficacious therapy. By contrast, adaptive licensing (AL) approaches are based on stepwise learning under conditions of acknowledged uncertainty, with iterative phases of data gathering and regulatory evaluation. This approach allows approval to align more closely with patient needs for timely access to new technologies and for data to inform medical decisions. The concept of AL embraces a range of perspectives. Some see AL as an evolutionary step, extending elements that are now in place. Others envision a transformative framework that may require legislative action before implementation. This article summarizes recent AL proposals; discusses how proposals might be translated into practice, with illustrations in different therapeutic areas; and identifies unresolved issues to inform decisions on the design and implementation of AL.**

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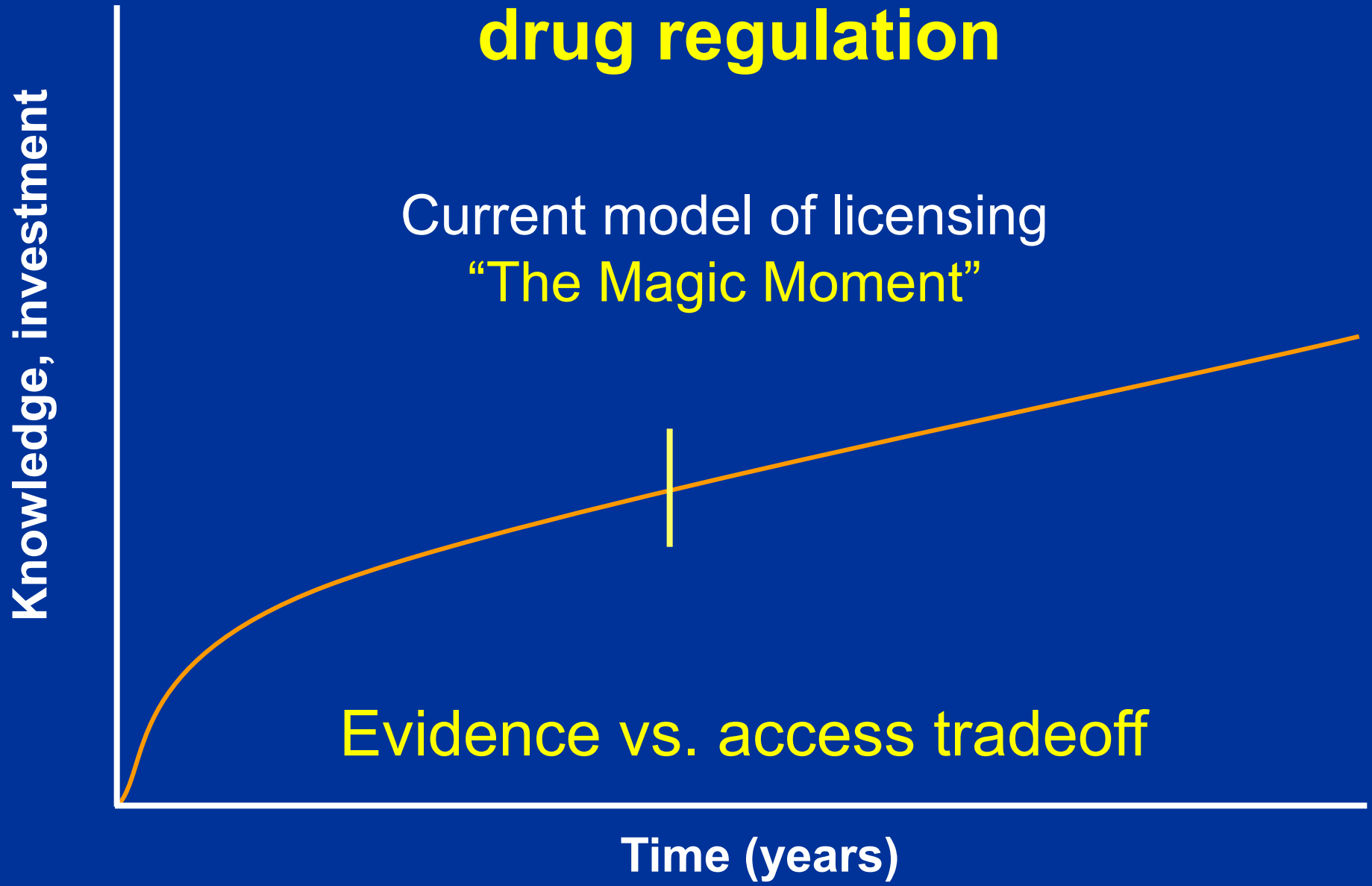
# The binary nature of drug regulation



# The regulator's dilemma

"…it has been said that the FDA has just two speeds of [drug] approval – too fast and too slow."

Hamburg MA & Sharfstein JM. NEJM 360;24: 2493-5; 2009

# A better model for evolution?

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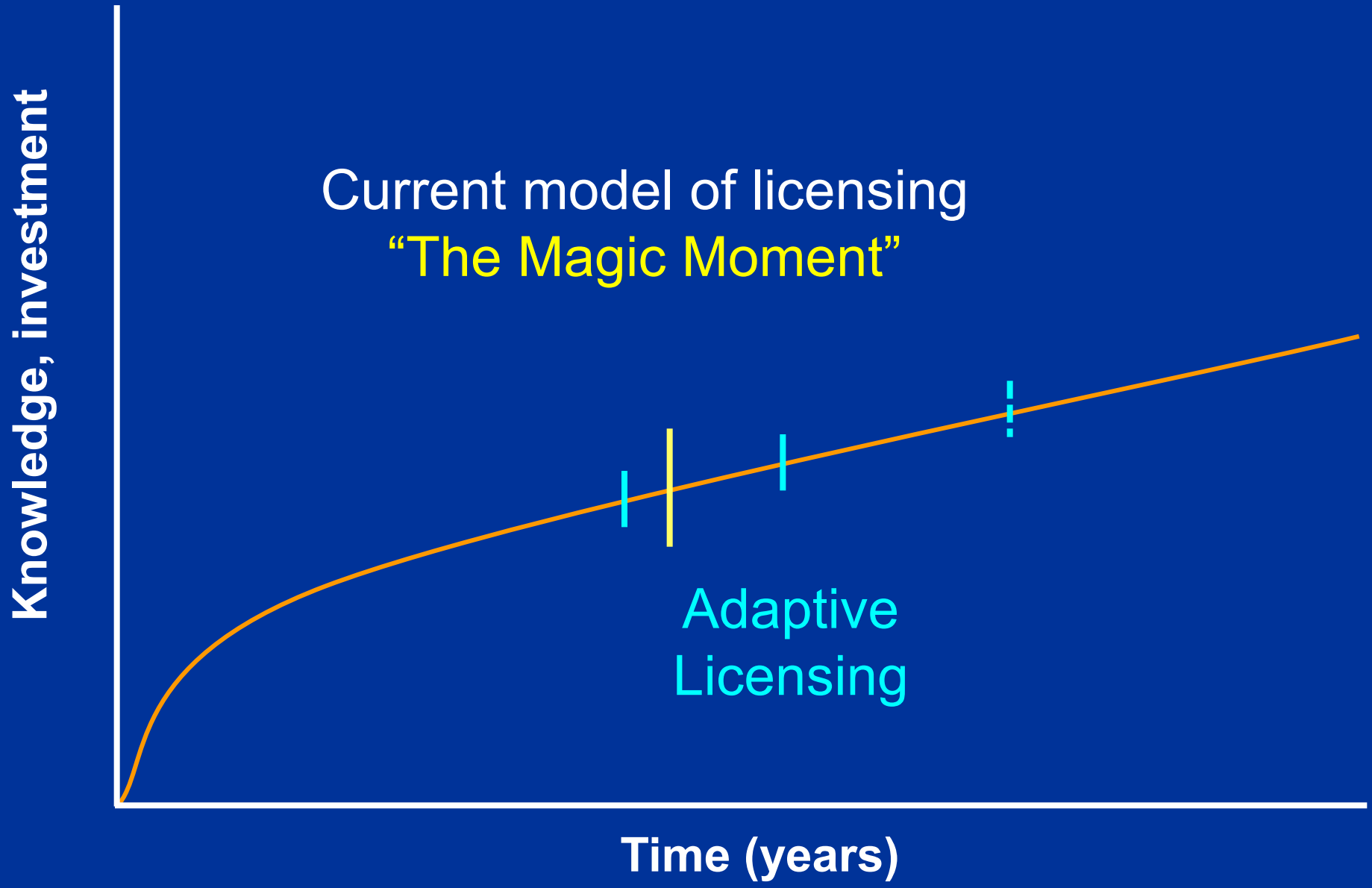

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# Adaptive Licensing

AL is a prospectively planned, adaptive approach to regulation of drugs.

Through iterative phases of evidence gathering followed by regulatory evaluation and license adaptation,

AL seeks to maximize the positive impact of new drugs on public health

by balancing timely access for patients with the need to provide adequate evolving information on benefits and harms.

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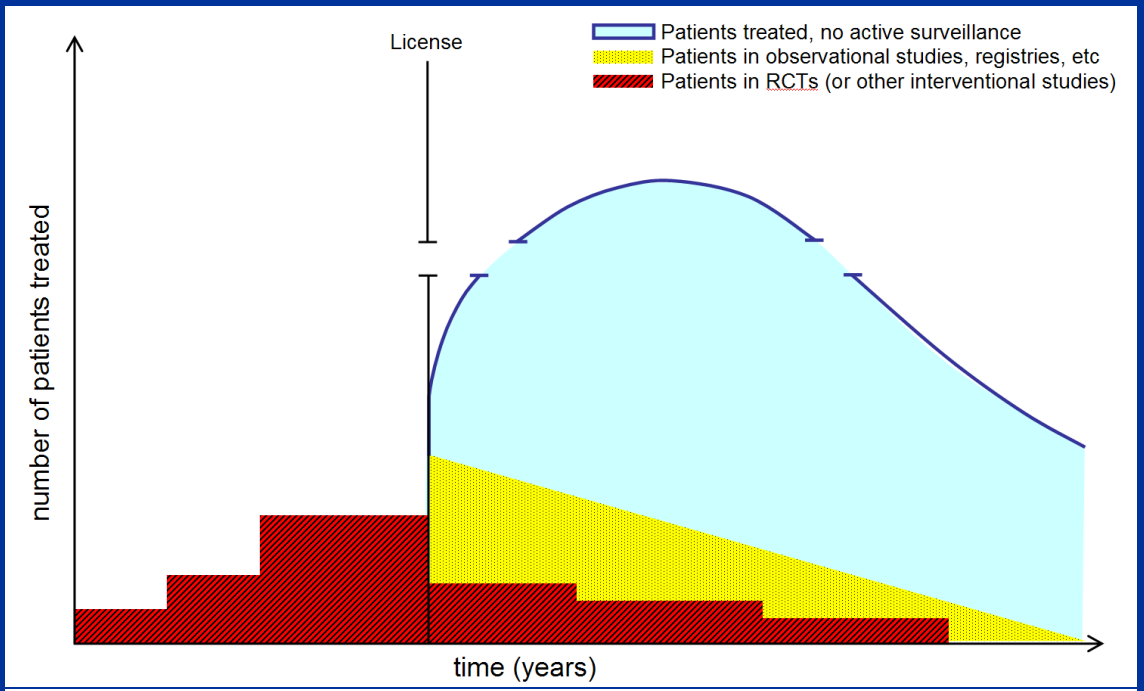
# Adaptive Licensing

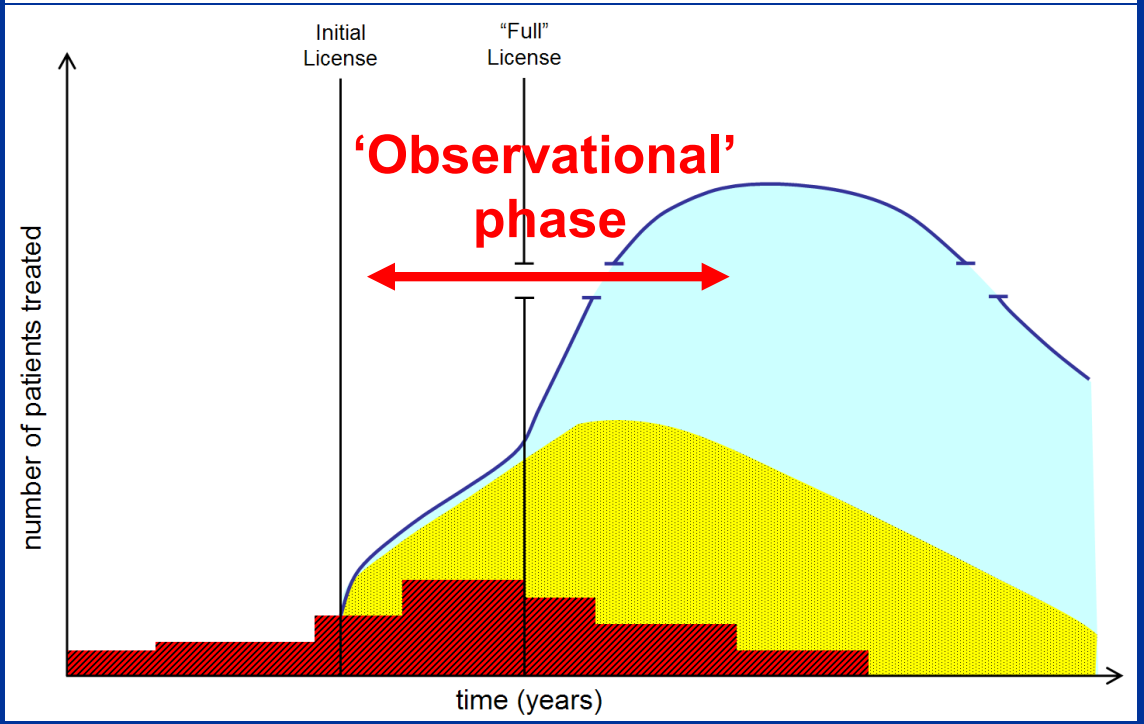
AL builds on existing regulatory processes, including AA/CMA and existing PharmacoVigilance tools.

To achieve the full potential of AL, licensing decisions should ideally be aligned with coverage and prescribers' decisions.




## Current scenario:

Post-licensing, treatment population grows rapidly; treatment experience does not contribute to evidence generation




## Adaptive Licensing:

after initial license, number of treated patients grows more slowly, due to restrictions; patient experience is captured to contribute to real-world information

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# Grading of evidence and regulatory decision making

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Ia: systematic review or meta-analysis of RCT's

Ib: at least one RCT

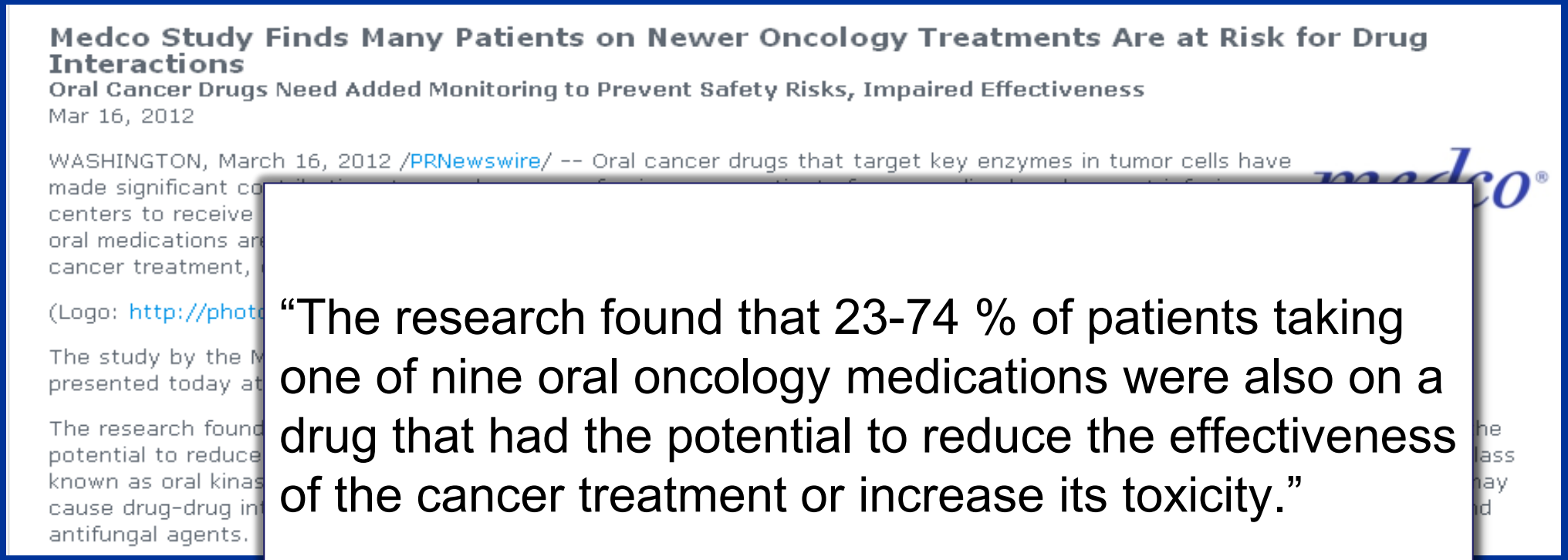
IIa: at least one well-designed controlled study without randomisation

IIb: at least one well-designed quasi-experimental study, such as a cohort study

III: non-experimental descriptive studies, e.g. comparative studies, correlation studies, case–control studies and case series

IV: expert committee reports, opinions and/or clinical experience of respected authorities

# Are we effectively learning about new therapeutics being developed?



**Medco Study Finds Many Patients on Newer Oncology Treatments Are at Risk for Drug Interactions**

**Oral Cancer Drugs Need Added Monitoring to Prevent Safety Risks, Impaired Effectiveness**

Mar 16, 2012

WASHINGTON, March 16, 2012 /PRNewswire/ -- Oral cancer drugs that target key enzymes in tumor cells have made significant co
centers to receive
oral medications ar
cancer treatment,

(Logo: http://photo

The study by the M
presented today at

The research found
potential to reduce
known as oral kinas
cause drug-drug in
antifungal agents.

medco®

"The research found that 23-74 % of patients taking one of nine oral oncology medications were also on a drug that had the potential to reduce the effectiveness of the cancer treatment or increase its toxicity."

**Source: Medco March 16, 2012**

# Rapid Learning Systems

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- NEWDIGS supports a project focused on looking at the real world association of cardiotoxicity with use of Adriamycin.
- Start by looking at data within one hospital, then scale the research through a partnership with ASCO to analyze a larger, cross-institutional data set.
- The purpose of this project
  - to provide useful decision-making information for clinicians,
  - to look at the correlation of RCT vs. real world data around an important clinical question.

# Conclusion

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- Multi-stakeholder partnerships can be effective in stimulating innovation, even in the policy field
- Change driven from single silos (e.g. regulator, public or industry) will, more often than not, meet resistance from other ecosystem parties

- Future development-licensing-market entry pathways will require more than just RCTs
- 'Rapid learning systems' will be a *sine qua non,* especially in oncology

# Thank you!

**(EMA, Canary Wharf, London)**

# Discussion slide

# Looking at real-world data

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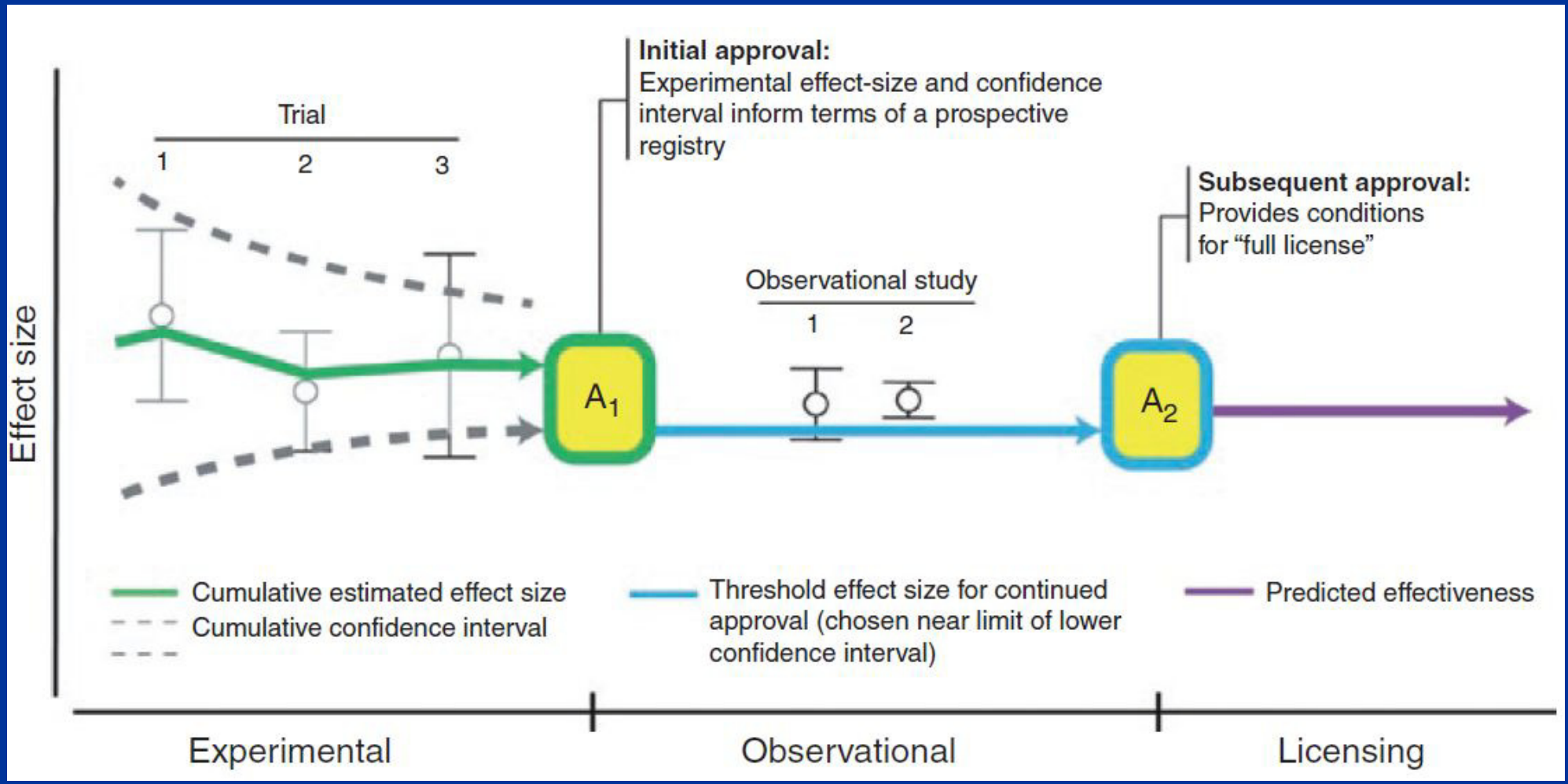


Eichler et al; Clin Pharmacol & Ther 2012; 91(3): 426