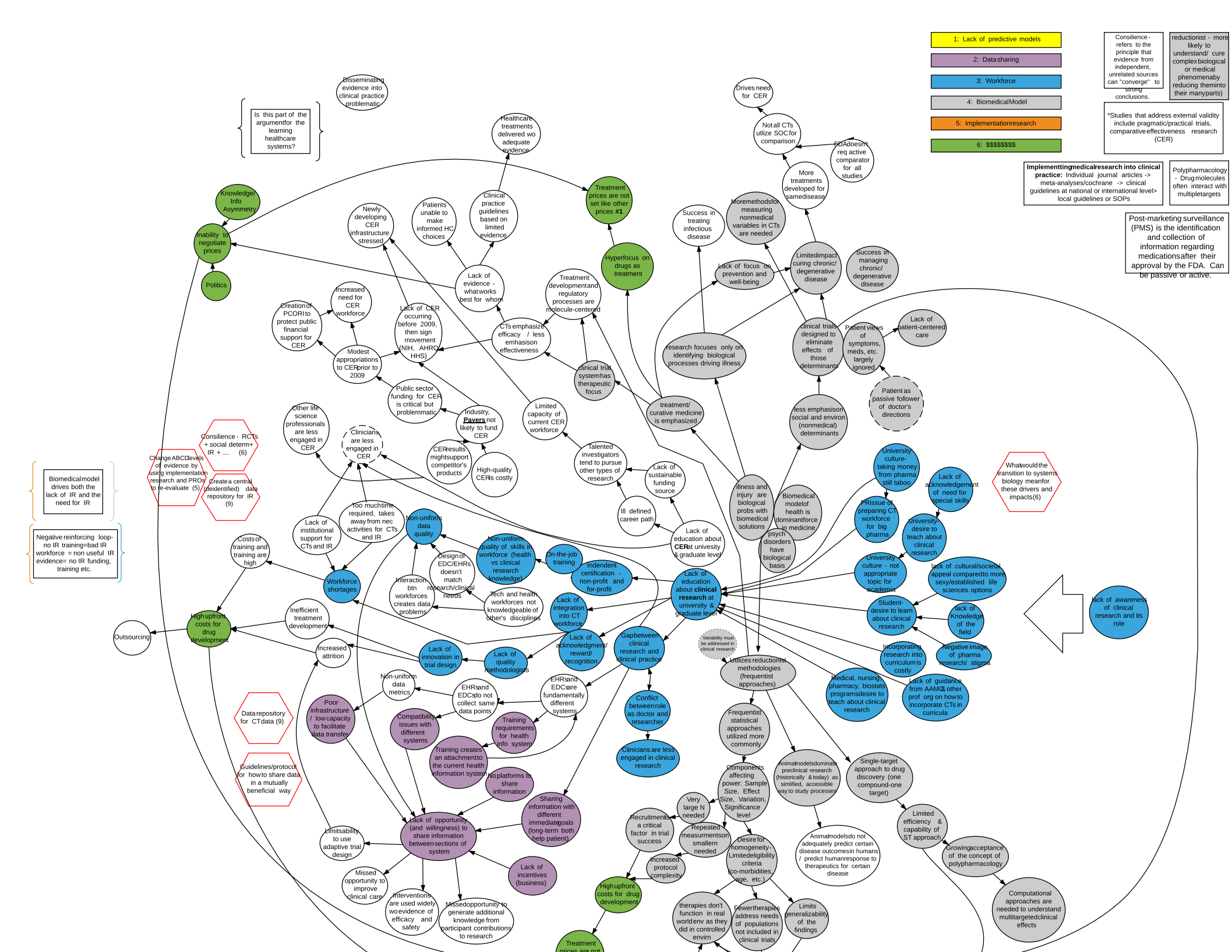
1: Lack of predictive models
2: Data sharing
3: Workforce
4: BiomedicalModel
5: Implementationresearch
6: $$$$$$$$
Consilience - refers to the principle that evidence from independent, unrelated sources can "converge" to strong conclusions.
reductionist - more likely to understand/ cure complex biological or medical phenomenaby reducing theminto their manyparts)
*Studies that address external validity include pragmatic/practical trials, comparative effectiveness research (CER)
Implementtingmedicalresearch into clinical practice: Individual journal articles -> meta-analyses/cochrane -> clinical guidelines at national or international level> local guidelines or SOPs
Polypharmacology - Drug molecules often interact with multipletargets
Post-marketing surveillance (PMS) is the identification and collection of information regarding medications after their approval by the FDA. Can be passive or active.
Is this part of the argumentfor the learning healthcare systems?
Disseminating evidence into clinical practice problematic
Healthcare treatments delivered wo adequate evidence
Treatment prices are not set like other prices #1
Knowledge/ Info Asymmetry
Inability to negotiate prices
Politics
Newly developing CER infrastructure stressed
Patients unable to make informed HC choices
Clinical practice guidelines based on limited evidence
Lack of evidence - what works best for whom
Hyperfocus on drugs as treatment
Drives need for CER
Not all CTs utlize SOC for comparison
FDAdoesn't req active comparator for all studies
More treatments developed for samedisease
Success in treating infectious disease
Moremethodsfor measuring nonmedical variables in CTs are needed
Limitedimpact curing chronic/ degenerative disease
Success in managing chronic/ degenerative disease
Lack of focus on prevention and well-being
Treatment developmentand regulatory processes are molecule-centered
Increased need for CER workforce
Creation of PCORI to protect public financial support for CER
Lack of CER occurring before 2009, then sign movement (NIH, AHRQ, HHS)
CTs emphasize efficacy / less emhasison effectiveness
Modest appropriations to CER prior to 2009
Public sector funding for CER is critical but problemmatic
Industry, Payers not likely to fund CER
clinical trial systemhas therapeutic focus
research focuses only on identifying biological processes driving illness
clinical trials designed to eliminate effects of those determinants
Patient views of symptoms, meds, etc. largely ignored
Lack of patient-centered care
Patient as passive follower of doctor's directions
treatment/ curative medicine is emphasized
less emphasison social and environ (nonmedical) determinants
Limited capacity of current CER workforce
Other life science professionals are less engaged in CER
Clinicians are less engaged in CER
CERresults mightsupport competitor's products
High-quality CERis costly
Talented investigators tend to pursue other types of research
Lack of sustainable funding source
Ill defined career path
Lack of education about CERat univesity & graduate level
Consilience - RCTs + social determ+ IR + ... (6)
Change ABCDevals of evidence by using implementation research and PROs to re-evaluate (5)
Create a central (deidentified) data repository for IR (9)
BiomedicalModel drives both the lack of IR and the need for IR
Negative reinforcing loop- no IR training=bad IR workforce = non useful IR evidence= no IR funding, training etc.
Too muchtime required, takes away from nec activities for CTs and IR
Lack of institutional support for CTs and IR
Non-uniform data quality
Costs of training and training are high
Workforce shortages
Non-uniform quality of skills in workforce (health vs clinical research knowledge)
On-the-job training
Indendent certification - non-profit and for-profit
Design of EDC/EHRs doesn't match research/clinical needs
Interaction btn workforces creates data problems
Tech and health workforces not knowledgeable of other's disciplines
Lack of integration into CT workforce
Lack of education about clinical research at university & graduate level
Illness and injury are biological probs with biomedical solutions
Biomedical modelof health is dominantforce in medicine
psych disorders have biological basis
University culture- taking money from pharma still taboo
Lack of acknowledgement of need for special skills
Risk of preparing CT workforce for big pharma
University desire to teach about clinical research
University culture - not appropriate topic for academia
lack of cultural/societal appeal comparedto more sexy/established life sciences options
Student-desire to learn about clinical research
lack of Knowledge of the field
Negative image of pharma research/ stigma
Incorporating research into curriculumis costly
Lack of guidance from AAMC& other prof org on howto incorporate CTs in curricula
Medical, nursing, pharmacy, biostats programsdesire to teach about clinical research
Whatwould the transition to systems biology meanfor these drivers and impacts(6)
lack of awareness of clinical research and its role
Outsourcing
High upfront costs for drug development
Inefficient treatment development
Increased attrition
Lack of innovation in trial design
Lack of quality methodologists
Lack of acknowledgment/ reward/ recognition
Gapbetween clinical research and clinical practice
Variability must be addressed in clinical research
Utilizes reductionist methodologies (frequntist approaches)
Non-uniform data metrics
EHRsand EDCsdo not collect same data points
EHRsand EDCsare fundamentally different systems
Poor infrastructure / low capacity to facilitate data transfer
Compatibility issues with different systems
Training requirements for health info system
Training creates an attachmentto the current health information system
No platforms to share information
Data repository for CTdata (9)
Guidelines/protocol for howto share data in a mutually beneficial way
Conflict between role as doctor and researcher
Clinicians are less engaged in clinical research
Frequentist statistical approaches utilized more commonly
Components affecting power: Sample Size, Effect Size, Variation, Significance level
Animalmodelsdominate preclinical research (historically & today) as simlified, accessible way to study processes
Single-target approach to drug discovery (one compound-one target)
Limited efficiency & capability of ST approach
Growingacceptance of the concept of polypharmacology
Computational approaches are needed to understand multitargetedclinical effects
Very large N needed
Recruitments a critical factor in trial success
Repeated measurmentson smallern needed
Desire for homogeneity- Limitedeligibility criteria (co-morbidities, age, etc.)
Animalmodelsdo not adequately predict certain disease outcomesin humans / predict humanresponse to therapeutics for certain disease
Increased protocol complexity
Lack of opportunity (and willingness) to share information between sections of system
Sharing information with different immediategoals (long-term both help patient)
Limitsability to use adaptive trial design
Missed opportunity to improve clinical care
Lack of incentives (business)
Interventions are used widely wo evidence of efficacy and safety
Missedopportunity to generate additional knowledge from participant contributions to research
High upfront costs for drug development
therapies don't function in real world env as they did in controlled envirn
Fewertherapies address needs of populations not included in clinical trials
Limits generalizability of the findings
Treatment prices are not

wo evidence of efficacy and safety
generate additional knowledge from participant contributions to research
Treatment prices are not set like other prices #2
therapies don't function in real world env as they did in controlled envirn
Fewer therapies address needs of populations not included in clinical trials
Limits generalizability of the findings
needed to understand multitargetedclinical effects
Lack fo evidence - what works for whom
Drives need for CER
Drives need to make efficacy studies more generalizable
Evaluating effectiveness req variety of methodologies beyond trad RCT(e.g. pragmatic CT)
Learn from failure (13) to improve business model
CT Recycling Company
Yes Ichan
IR allows insight from social and environmental factors. Change levels of evidence using IR.(5)
Use IR to generate evidence for non-gold standard approaches, target successes with no RCTs(11)