Motivation:
The Learning Health System (LHS) is a health infrastructure marrying policy and technology to promote:
• Data sharing
• Analyses that convert data to knowledge
• Application of knowledge to improve health
The LHS can transform health care and health, but raises myriad cross-disciplinary scientific research challenges.

Transformative:
The workshop informs priorities for future research:
• Envisions an integrative cross-disciplinary science of learning systems / cyber-social ecosystems.
• Identifies 106 research questions organized into 19 subcategories around 4 system-level requirements that a high-functioning LHS must satisfy.

Broader Impacts:
• The research questions create an important agenda for informatics, computer and information science, and an array of related disciplines.
• The new science of learning systems has applicability that extends beyond health domains.

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http://healthinformatics.umich.edu/lhs/nsfworkshop

Technical Approach:
The NSF convened a two-day invitational workshop (April 2013).
• 45 prominent researchers spanning multiple and diverse disciplines
• Worked collaboratively to identify LHS research challenges and the new science to address these challenges

Progress and Results:
• Workshop report completed: http://healthinformatics.umich.edu/lhs/nsfworkshop
• Dissemination through Journal article (submitted), presentations at prominent health care informatics, public health, and systems sciences meetings
• Growing a broader community of interest and catalyzing ongoing follow-up activities including mini-tracks at key meetings

Discussion of Results:
The 4 system-level requirements for an LHS:
1. Trusted and valued by all stakeholders
2. Economically sustainable and governable
3. Adaptable, self-improving, stable, certifiable, and responsive
4. Capable of engendering a virtuous cycle of health improvement

The novel emergent science of learning systems needs to address the identified research-challenge questions.
• An evolution from a science of information systems, through a science of cyber-physical systems, and ultimately to a science of cyber-social ecosystems.
• The applicability of this new perspective to solving challenging problems may transcend the health domain.