Berlin Systems Conference Keynote Speech
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Support Optimal Life Trajectories with Computerization and With Continuously Improving Tools for Care

It is a great honor to be able to keynote this Digital Leaders Health Care Summit in Berlin on this beautiful November day. Thank you for having me here at your event.

Health care is on the cusp of a golden age for computer supported care.

We are on the cusp in most countries of having actual electronic data on every person — and we are on the path to having that data available in real time to both the patient and to the caregivers for that patient across the planet.

All health care sites now use computers. Every American care site now uses computers.

So various kinds of electronic medical records now exist for almost all sites of care. That actually gives us a very good place to be right now relative to future use of data to support care.

But —

That information is currently highly siloed. It is segregated by site.

The data from each site tends to be available only to the caregivers and patients at each site today.

That will soon change — because we are moving into a world where tools will exist and plans will be in place to share that data between sites in patient specific ways.

The new FIHR process is intended to be one of those tools. Multiple other care data connectivity tools are being built by a wide range of organizations and will offer connectivity tools to both payers and care sites.

If we do that connectivity work well, care will improve significantly. Care for complex patients tends to be supported very badly today in most care sites by not having caregiver access to all of the data about all of the care being delivered to or being used by each patient in any effective way.

The average Medicare patient in America has more than half a dozen doctors, and in most care sites today, those doctors have no way of sharing information about that patient.

The best care sites in our country today already offer both team care and completely shared medical information — and care at those sites is consistently better and more patient focused now.

Patients love it when their care data is combined in ways that they can see and use.

We need everyone to be able to benefit from the best care levels with the best access to their own data and to all relevant information about their health issues and their own care.

The future of care should involve data connectivity tools that connect all care sites relative to their patients care.

The tool kit for care is getting better daily. Artificial Intelligence is going to be a major tool in that kit, and that will happen fairly rapidly because there is so much low hanging fruit to be plucked in those areas.

Artificial intelligence will make care more science based and more personally relevant and more effective for each patient in the settings where that functionality exists.

That is a good thing.

We are on a clear and immediate path to use artificial intelligence algorithms to both make better diagnosis and to create better and more effective care plans and then to be able to do follow up monitoring and coordination at multiple levels for patients that will optimize patient care outcomes and patient health.

We need patients connected to their caregivers electronically where ever they are — so that the home or worksite and every other patient location can be highly effective sites for care in the most patient friendly and easy to use ways.

We need to stop thinking just of the traditional care sites for our delivery of care.

We now need to think of five sites of care---medical offices of various kinds, hospitals, other linked physical care sites, homes, and the internet…with the internet being available everywhere all of the time to both caregivers and patients and serving as a major care delivery tool that many patients will prefer for many areas of care.

We have the ability to do massive data connectivity in other industries now, and we need to apply those approaches and those strategies to the delivery of care.

My old care system has gone down many of those paths, and they work.

Kaiser Permanente has complete medical records on over twelve million patients, and that information both improves care and makes care more accessible to patients.

Patients prefer electronic connectivity to happen in the most convenient ways for many levels of care. Kaiser owns more than five hundred medical care sites and nearly fifty hospitals. There is no paper in those completely connected care sites. They all have the ability to link care data to their patients and to their caregivers in real time.

This year, more than sixty percent of the direct Kaiser Permanente patient visits for 12 million patients will actually be electronic.

That number was forty percent when I retired. Patients prefer easy electronic connections for many elements of care and have chosen to use that approach to receiving care when it became available to them.

The care that results can be excellent care.

The Kaiser Permanente care system has received the top-quality ratings from Medicare for eight straight years.

Quality processes follow a continuous improvement process and approach.

The infection rates in the hospitals is managed though continuous improvement processes and the number of pressure ulcers, for example, dropped from over fifteen percent of patients to under ten percent and then to under two percent.

The year I retired, five hospitals did not have one single ulcer.

Care is better when we use both continuous improvement processes and complete and robust directly relevant data to support each part of the delivery process.

That work on making computer supported care better that has been happening at KP is directionally correct, but it is only part way to where we need to go.

We now also need to add artificial intelligence to the care delivery mix. Some care sites in our country are doing that now in very effective ways and their initial results reinforce the momentum of that approach.

Artificial intelligence tools will allow caregivers to figure out optimal care on a targeted basis for each patient and will improve care in ways that can only be done using large data bases and that tool.

The Mayo Clinic has more than two hundred artificial intelligence projects happening right now — and some of them have already significantly improved both disease detection and disease treatment for their care sites.

The Mayo ability to predict future heart events has increased significantly using algorithms from basic and flexible information sources for each patient.

We need patients everywhere to benefit from those tools.

That should be possible to do.

We need to step back and create an overarching commitment as an industry to use the new tools to significantly improve care for patients everywhere.

We need what I call SOLT.

Support Optimal Lifetime Trajectories for care.

Each of those words has value and intent.

Support is clear. We need computers to support the delivery of care.

Optimal is also important. We should not settle for Good Enough care.

We should commit to Optimal Care and to Optimal care outcomes.

To change life trajectories in optimal ways.

Optimal Care will probably cost much less than suboptimal care costs today because we will utilize resources far more effectively when we use continuous improvement processes to make care better.

We don't have a resource problem for care when we do better diagnosis, better care plans, better care connectivity, and better science for care.

We can reduce unnecessary hospitalization by very large numbers when we significantly reduce the number of people who need to be hospitalized.

Right now, misdiagnosis is the third leading cause of death in American hospitals, and some people who looked at earlier research about the frequency of diagnosis being wrong in patients who died in hospitals indicates that number is probably significantly understated.

There are major expenses associated with mis diagnosis alone because the wrong care is being delivered to those mis diagnosed patients and too many of them run up major expenses and then unnecessarily die.

That high error rate that we see today gives us a wonderful opportunity to use computers well to significantly improve both the accuracy of diagnosis and to improve the speed of diagnosis

and the speed of coming up with plans to respond in the most effective way to each diagnosis for each patient.

Social determinants of health need to be part of that overall agenda — both to understand their impact on each patient and to steer people down the right trajectories for their lives to minimize adverse situations and experiences.

We need to start those trajectories at birth — and we need to look at both operational and epigenetic factors for our patients that we are beginning to understand with growing insight and wisdom.

We are moving beyond genetics to epigenetics, and as we get better at understanding the various ways that we can use epigenetic realities for each of us, we will be able to use our growing knowledge of epigenetics to steer patients down better paths in extremely well informed and appropriate ways that give us better lives in important areas of who we are and what we do.

We need to do epigenetic planning for each of us in very direct and specific ways and we need to continuously increase our knowledge in those areas of care.

As part of that process and as reinforcement for that agenda and approach, we now have a much better understanding of the impact of adverse childhood experiences on people's entire lives.

There is a growing body of evidence about the lifetime impact at multiple biological, psychological and physiological levels of having adverse experiences early in life.

We know from the ACE research that people who had four or more ACES in their early life are twice as likely to have cancer as an adult. The people with four or more ACES are also four times more likely to have emphysema, seven times more likely to be alcoholic and twelve times more likely to attempt suicide.

We also know from extensive new research and insights that the children who do not get the right brain stimulation by having direct and constant parental and adult interactions in the first two years of life are four times more likely to drop out of school — five times more likely to use alcohol and drugs, six times more likely to get pregnant in school, and eight times more likely to end up in prison.

We know that sixty percent of African American males who dropped out of high school are in jail today — compared to ten percent of the African American males who graduated from high school — and we know from the new brain science about the building of neuron connections in the brain in the very first years of life that are based on adult interactions with each child that we can now predict with almost eighty percent accuracy by age two which path each of those African American males was on.

Age two is actually hugely important as a basic societal direction point for people's lives. We need to understand how important that age is.

The children who have fallen behind by age two almost never catch up. The negative and damaging social determinants of health that result from unemployment and incarceration are huge and we now know that a large number of people from some groups who have fallen behind at that point are eight times more likely to be in jail during their lives.

We are beginning to understand that the biggest single thing you can do to improve the lifetime health and to improve the social determinants of health personal life trajectory for each child from every group is to have someone talk and read and interact, and sing with that child in the first weeks and first two years of life to get children down a path with fewer adverse experiences and with a stronger personal ability to learn and to be socially and emotionally well grounded.

Most people who look at those issues and who look at the impact of reading scores and computation ability scores at age fifteen in all of those areas can say with a high level of certainty that many of the social determinants of health for life will clearly be worse for the children who cannot read and for the children who cannot do basic math at that point in their lives.

People overlook that extremely important biological and sociological early childhood development reality for both economic and political thinking because medical science was wrong for many years about the developmental processes that happen for children from every group in those first months and years and we have failed miserably in closing learning gaps in our schools for more than thirty years because we have tried to close the learning gaps at fifteen years and not at fifteen months.

Ninety percent of the murders in Chicago are done by gang members. Ninety percent of the gang members dropped out of school. We can know with more than eighty percent accuracy by age two which children in Chicago have not connected billions of neurons in those first two years and will drop out of school and end up in gangs.

If we want to think about life trajectories rather than just life events, we need to look at the neuron development situation for each child in the first two years of life — and we need to build our plans to help each child based on those experiences, and we need to do other things to help the children who have fallen behind at that point.

At a larger level, we need to prevent adverse childhood experiences…Aces.

We know from the ACE research work on Adverse Childhood Experiences that people who had four or more ACES in their life are far more likely to have damaged lives.

Kaiser Permanente did that ACE research. It was extremely important for KP to be the site for that research, because it was done with a population of moderate-income people with good jobs who were all living in a good community and all getting care from the same very good Kaiser Permanente care system, and the people with four or more ACEs were still twelve times more likely to attempt suicide.

When we are building computer assisted care plans for people, one of the factors that should be included in the artificial intelligence data base is the number of ACEs in each patient's life.

Artificial intelligence will be able to do some things relative to care that will feel almost magical.

Kaiser Permanente has all of the health care data on twelve million people and has been able to use that information to do some significant research just using the old research models that preceded artificial intelligence.

As one example, when one of the obstetricians in a Kaiser site believed that he noticed that a highly disproportionate number of children who were born to mothers who he had treated during pregnancy for uterine infections seemed to have asthma, he pointed that observation out to the Kaiser research team. They went to the computers and pulled the data on mothers who had that infection — and then they pulled the data on the children who were born to those mothers and they found out that that particular observant obstetrician had made an accurate supposition about that linkage.

Those children whose mother had a uterine infection during pregnancy were, in fact, significantly more likely to have asthma.

Kaiser Permanente keeps track of data by race and ethnicity as part it's care improvement agenda — so the researchers also found that white children were forty percent more likely to have asthma if their mother had that infection.

They discovered that the African American children were fifty percent more likely to have asthma, and they found out that the Hispanic children were sixty percent more likely to have the disease.

They also discovered that the Asian American children whose mother had the disease had zero increase over Asian American children whose mothers did not have that infection.

Zero.

There was no increase in Asthma for Asian American children.

That was extremely unexpected and both extremely interesting and useful information.

Nobody knows why those differences exist between any of those groups.

A really good social determinants of health study and analysis might identify differences in air quality or something environmentally similar to account for the first three sets of differences, and maybe some patterns in the food eaten by the Asian American children that created that major difference.

That's where we need AI.

We need an AI process and more data on the genetic composition of those patients to figure out why those differences exist and what to do about it.

That issue about why those differences exists only exists as a question because Kaiser has the full electronic data on mothers and on children and can look at that data because it is one care system and can study its own data.

That is just a tiny tip of the iceberg for what we are about to learn.

At a macro level, we need our country to do the things now that need to be done to connect care data. All care providers now have computer systems of some kind. That is far better than not having any data in the care sites.

We now need to go the next step and build new and better tools at this point to help those systems link.

The new FIHR system and tool are intended to make that happen. We need tools that tie to each system and make it linkable in a usable way and FIHR is one of several attempts to do that.

We need FIHR or some other equivalent tool to be everywhere — and we need to set up an agenda for connected care that allows all of those computerized data bases to connect.

We need to do that in a context where the key social determinants of health factors are used as part of the fact gathering and care plan creation process in a systematic and continuously improving way.

We have some huge data bases building now to do that kind of work. The Kaiser Permanente data base has data from more than twelve million patients and a completely owned system of clinics and hospitals and those systems look at several levels of social determinants of health as well as basic data about both biology and health.

Kaiser Permanente has kept track of death rates by zip codes for years, and has shown for a couple of years that major differences in the death exist at the zip code level even in the Kaiser system.

United Health Care and Optum now have more than a hundred million patients as members, and they have been hiring doctors to build their own care system to do many of the things that Kaiser does. They now have over forty thousand physician level care givers in that owned care system.

More importantly, they also have the Optum Systems computer team to run their own algorithms against that data base to improve care for their patients.

They keep track of that data real time to use it to improve care in a number of ways.

Mayo Clinic also has 10 million people in their data base, and they will be building their own artificial intelligence tools and care improvement tools to use that data to make care better.

Epic Systems provides electronic medical records to more care sites than any other system — and Epic is going to join that care improvement and connectivity process in an interesting and important way by now supporting FIHR and by doing an Oncology Moonshot project with Mitre and Mayo and a dozen other prominent care organizations to make the care data connectivity agenda more functional across multiple systems.

Those organizations are all are planning to build some level of social determinants of health data into their new Cancer Moonshot project.

Overall.

Health care is on the cusp of a golden age.

We need to have that golden age happen in a construct where the result is systems that are supporting optimal life trajectories for each of their patients.

In the communities and countries where laws prevent many levels of large-scale connectivity from happening, we need to prioritize which elements of care need to be on the computer to make care better. The answer is not that we need huge data bases to do research on populations — but we definitely need our patients to be able to each give permission to have their own data connected to support their care.

That is the most important use of data. The human genome is the same everywhere, so those levels of research don't need to be done everywhere. They just need to be done somewhere.

What we need is each country to be able to connect care directly for each patient with the approval of the patient.

Laws can protect privacy — and care will get a lot better.

SOLT is a good way to think about that opportunity for all settings.
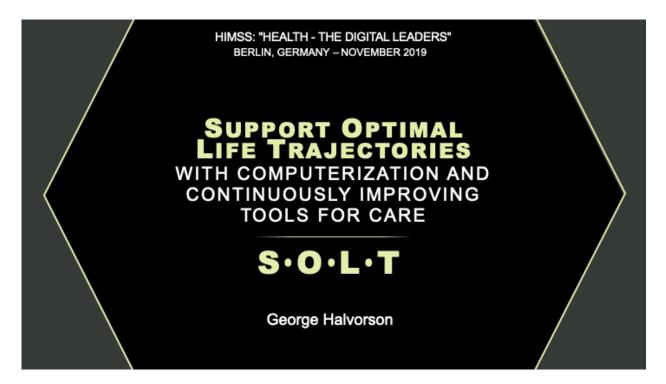
Support Optimal Life Trajectories.

This conference and summit is going to look at many of those opportunities and issues.
Have a wonderful conference and know that the world needs you to do this well and to do it now.

Have fun in the process and find joy in what you discover and do.

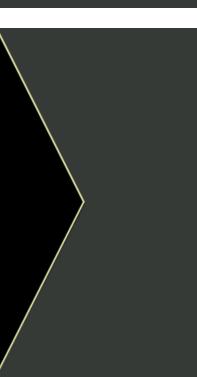A golden age is both a good and golden place to be.

View George Halvorson's visual slides below:

Healthcare is on
the Cusp of a
Golden Age

Care Data is now
Computerized but Highly
Siloed
Around the World

Today, the Best Care Sites Offer
**Team Care,
Patient Focused Care**
and
Shared Data

**Artificial
Intelligence**
Will Enhance and
Continuously Improve
the Process

We Have **5** Sites of Care

Medical Offices of Various Kinds

Hospitals

Other Linked Physical Care Sites

Homes

The Internet

Patients Prefer **Electronic Connectivity** to Happen in the Most Convenient Ways for Many Levels of Care

This Year, More Than **60%** of the Direct Kaiser Permanente Patient Visits for **10M** Patients Will Actually Be **Electronic**

Continuous Improvement Should Be an Underlying Process, a Commitment, and a Goal

We Need Patients Everywhere to **Benefit from Those Tools**

SUPPORT

OPTIMAL

LIFETIME

TRAJECTORIES For Care

Social Determinants
of Health Need to be
Included in the Toolkit
and Embedded

ACES
**Adverse Childhood
Experiences**
Create Major
Healthcare Problems
and Challenges

There are
10 ACES

Data Shows
that if you have
4 or More
You are More
Likely to have
Health Problems

Early Brain
Stimulation
and
Early Brain
Development
in the first
2 years of Life is Also
Extremely Important

The Best Care Sites are
Currently Using
Electronic Data Tools
Very Well

Researchers at Kaiser Permanente Found that
White Children were 40%
More likely to have Asthma if their Mother
had a Uterine Infection during Pregnancy

African American 50%

Hispanic 60%

Asian American 0%

Connect All Care
and **Utilize the Data**
in Continuously
Improving Ways

We Need Systems Like
FIHR and **Other Data Connectors**
to Include Social Determinants
of Health to Create
Optimal Care

SUPPORT OPTIMAL
LIFE TRAJECTORIES

S·O·L·T

A GOLDEN AGE
IS A GOOD/GOLDEN
PLACE TO BE!