Introduction

This document is a structured summary of a Tully meeting organised in May 2012 to contribute to the RCP Commission for the Future Hospital.

The Tully Meetings, hosted at the RCP, brought together over 100 leading clinicians and computer scientists, freed of commercial and organisational agendas. The meetings were professionally facilitated to encourage thoughtful and constructive dialogue, which was recorded. This style of interdisciplinary but joined-up dialogue is absolutely critical to input into a future hospital process, and indeed to provide ongoing reviews as the reality develops. Computer scientists, who implement systems, started to understand clinical tasks and needs; clinicians started to see technical opportunities. Future hospitals designed without this sort of collaboration will not be able to take full advantage of advances in technology.

There is a lack of overlap between think tanks and companies and clinicians who use them. It is crucial that clinicians and technologists speak the same language; this can only come about through facilitated processes like Tully Meetings.

By their nature, the Tully Meetings input to the RCP Future Hospital are emphasising healthcare-IT issues. Of course, the future hospital will have many other complex and exciting issues (e.g., infection control) as well as IT issues unrelated to clinical concerns (e.g., environmental control).

We noted that it was hard to get an explicit patient voice properly engaged with this process, and some claims were made that patients, if represented, may have challenged.

This document provides:
1. some general points;
2. contributions under headings as already identified by the RCP Commission;
3. some random notes.

It documents the points made how they were made. We have not tried to manipulate the meaning but to report what was said.
1. General points
How will a future hospital agenda be shared and understood by all? (If it isn’t, it won’t happen.)

The Future Hospital is an international vision. The RCP should liaise with international groups.

Ways to use technology to help prevent or delay use of the future hospital needs (prophylaxis) also deserve joined-up consideration. Not just mobile/telecare technologies, but addressing the full life cycle of a patient: the future hospital agenda should be considered as part of a much larger vision — impacting school curricula and clinician training for example.

1.1. Principles for healthcare IT for the Future Hospital Commission
Emerging principles for records
- Patients as participants, not recipients
- Integrated, patient-centred records will be key
- Incentivise data collection — ensure benefits
- Standards-based data collected in real time
- Present information that is fit for purpose
- Make use of personal technology held by both patients and professionals
- Let the technology take the strain; it should be permissive, not restrictive

Principles for the process of development and implementation
- Evolutionary: expect errors, monitor and fix
- Standards-based interoperability
- Open – never get locked in to solutions
- Use IT as enable of change
- “The future is never achieved”

1.2. Comments about future planning
In envisioning the future, it is very easy to get carried away with “tunnel vision” seeing a bright idea in detail, but not thinking clearly about alternatives. We can only think about one thing, but the future is going to be more complex! One need only think about 1950s visions of the future with monorails — these things never happened, but they seemed an obvious future then. The future is going to continue to be in the future.

There are many futures, not just one future hospital. Also, every day, there will be a new future. The future hospital will be able to adapt and change. Not all of them will
be the same, and some will be using more advanced technologies and ideas than others. This is to be expected.

1.3. Confidentiality
Confidentiality is often raised as an issue of concern. It must not be allowed to become a smokescreen and, by doing so, inhibit creative discussion of future options.

1.4. Queue busting — flexible use
The best is the enemy of the good. Many people will say, “you can’t do that because some patient/clinician... won’t be able to do something.” That may be true, but helping some people will be better than not helping anyone because there isn’t a way of helping everyone.

In railway ticketing the notion of “queue buster” is to use IT to solve most people’s problems. In hospitals the aim is to reduce the workload of the clinicians helping complex cases. Note that “queue busters” are permissive: people can choose to use them if they want to, but the system must be able to accommodate those people (or patients) who don’t want to use it.

1.5. Permissiveness
The future hospital must be designed to be “permissive.” The technology should support the widest possible range of clinical practice, patient access to records, and so on. If a hospital, a clinician, or a patient decides not to take advantage of this liberal technology, that is fine. But if the technology is designed to be restrictive (or to impose compulsory processes) then it cannot be used in more flexible ways even if people want to use it. Restrictive systems encourage workarounds, and management (of any sort) will be unaware of the workarounds — and users of the systems may be unaware of the dangers of their well-intentioned workarounds.

In particular if a compulsory process fails in any way (e.g., a power outage), then it is almost impossible to work.

1.6. Unknown information
Systems should be able to work with unknown or guessed information, and never confuse it with correct information. There are cases of clinicians entering guessed patient weights just so they can use a patient’s record. The computer then records the guessed weight as a true weight, with likely misleading consequences later.
1.7. Expect system failures; detect and manage failures
There must be processes to learn from failures, hence there must be reporting systems to detect these. There will always be problems. The technology should help identify misuse/unusual use rapidly, so that incidents can be monitored. Machine learning can discover new forms of misuse; one does not need to define what misuse is.

1.8. Marketplace failure and standards
Big systems aren’t delivering. The market is failing to provide effective healthcare IT. Businesses tend to lock-in the NHS into (often costly) inadequate solutions. One way around this is *open source*. Suppliers can be paid to open solutions.

Arguably, reluctance to provide open source (even when paid) indicates the source is substandard; this is especially true of security software.

Another way is by *standards*, but using a standardised approach without clear thinking will stifle innovation. Too-strict application of standards will be detrimental to flexibility (e.g., new clinical conditions emerging).

1.9. The success of the World Wide Web
We must have universal data standards that work like the World Wide Web’s: that is, the standards almost work, but they work well-enough. The Web standards are developed through various processes, such as Requests for Comments (RFCs), and this approach obviously works well. The Web is successful despite some slight variation in how standards work — for example, all browsers are slightly different, but this doesn’t stop them being very useful.

If we permit small-scale experimentation, how do we unify all the various software that will be developed? We could produce an open source EPR that different organisations could add plug ins to. Plug ins (which of course require standards) are a good thing.

1.10. Development standards and certification
The ISO Standard 9241 (see ISO9241:210 in particular) says a computer system to be used by people must be designed from tasks. If clinicians say what they want (say a “cloud”) then technicians will give them a cloud. Whether it helps them do their task is another matter! Instead, technicians need to understand the task and its complexities (and ways it can go wrong), and then implement it, possibly using a
cloud or some other technology. Moreover, ISO9241 says design is iterative. The first systems will not do quite what was hoped, and they can be continually improved relative to their measured performance against benchmark tasks (which may have been previously defined, though some new tasks will be invented as the system starts to be used).

1.11. Proactive revision and development of new standards
We recommend a future hospital process identifies relevant international standards, and requires suppliers to conform to the standards. In fact, the RCP may wish to engage with standards bodies to develop more relevant standards. (ISO62366 is a standard for medical device design; it might be considered a template for hospital design.)

1.12. Requirements versus solutions
The cloud was starting to get established around 2008. The RCP should not be defining the future of the hospital relying on specific technology solutions that are unproven in healthcare, however promising they may seem. Will a cloud be dependable when there is a major incident (like the Paddington Rail crash, or a terrorist incident)?

The RCP should be specifying the requirements for the hospital of the future (that is, “cloud” used informally probably means data access anywhere, not a particular configuration of servers and connectivity), not the detailed solution supported by today’s technology.

Similar comments apply to ideas like “social media” (Facebook, etc). What is important is to identify the principles that help the future hospital, help the tasks of healthcare.

Open source, too, is one technique to overcome many limitations of proprietary software; it is not the only solution — and some open source software is rubbish — the intended requirement is to have high-quality software that does not lock users in (it avoids the problems of suppliers going bust), and possibly that it is easy to keep up to date.

So when we say “cloud” or “Facebook” we mean cloud-like and Facebook-like.

Some Tully groups said “principles not details.”
2. Contributions from discussions specific to the Future Hospital Commission Workstreams

2.1. Workstream 1 - People
- Shift from thinking about hospital as a place to Virtual Hospital – this changes our view about how people access information:
  - Medical staff to have ability to work offsite
  - Clerical, notes, monitoring patients remotely
- Proactive approach to your own sick patients – e.g., generating early warning scores so that other clinical staff could interpret changes in clinical state without the individual doctor being present.
- Full electronic medical record – so that all clinicians know the same things and there is better handover between shifts and operates irrespective of the consistency of teams.
- Access remotely for clinicians and patients, free flexible internet access.
- Quora – crowdsourcing expert medical opinion, i.e., having the ability to ask a wide range of experts for feedback.
- Enabling dynamic trainer input to portfolios, i.e., trainers can view current developments on-line and make real time contributions to training.

2.2. Workstream 2 - Paper and data
- Paper is an excellent example of permissiveness, and it is extremely reliable. Hospitals will always use paper or equivalent (if only for the pharmacy to stick on to packaging).
- Paper is needed as a backup – periodically and for particular situations.
- Agreeing standards for Open Data – single portal where people can access their own records with a single sign on (data.gov.uk).
- “Use anywhere” EPR – i.e., patients own the access (i.e., main/control access) but a trusted clinician can access with additional break glass facility in emergency.
- Social media style space, inviting doctors to your space/profile. Patient focus groups can maintain ecosystems.
- Physical USB with patient record encrypted – i.e., patient ownership of a physical object.
- Remote access to data not just to view but also to manage, e.g., collecting biometric data, decision support, selective feedback of data to clinicians (e.g., alerts) – patient management remotely, including supporting patient self-management.
- Bringing together data from all sources – GP, hospital, social care, patient generated, community – linking it together using the NHS number and using it both to make decisions about individual patient care and population level data analysis.
2.3. Workstream 3 - Place and process

- Story illustrating response: Patient goes into the hospital with their iPhone which triggers data transfer on going through the hospital entrance, e.g., path results, medication, appointments, and enable to ask the question: what else do you want to know? This would also enable patients to put questions to consultant prior to consultation.
- We noted that a physical hospital can change the behaviour of devices like iPhones; for example, a hospital could give devices to patients that would not work outside a hospital.

2.4. Workstream 4 - Planning infrastructure

- Principles of load balancing, real time monitoring, visibility of data for decision making (e.g., big screen visibility) and dynamic pathway analysis, based on service data, in order to predict future pressures on the hospital system and control current resource use, e.g., bed access.
- This requires open access data standards to enable information systems to interoperate/share information.

2.5. Workstream 5 - Patients and compassion

- Access to healthcare records – we recognise that this is not a settled matter – recommend that future hospital design should be built on patients having access to their records and there will be exceptions (e.g., patients choosing not to exercise this).
- It is beneficial for patients – including when being treated elsewhere, including between general practice and hospital, or abroad – which raises questions of interoperability.
- Question of how much detail – including record transfer between hospitals.
- Future hospital has to be resourced to make this possible and rectify any errors.
- Conveying patient’s perspective.
- How to take into account patients’ socioeconomic circumstance and concerns when planning care.
- Multidisciplinary approach to patient care – improving efficiency, e.g., when planning a discharge.
- Telemedicine and video conferencing could be utilised by physicians.
- How to recognise access to an uncertain diagnostic process. For example, “possible tumour” as a note on a scan.
3. Further notes

3.1. Principles to support the use of mobile devices in hospital settings

- All HCPs should be able to use their own mobile devices.
- All trust data are held in a secure manner but available across any mobile device.
- Wi-Fi should be freely available and free or via mobile data while in hospital.
- Information to contact other HCPs is available.
- Clinical guidelines would always be available.
- Relevant patient data and monitoring information may be available via Hospital IT networks.
- Waiting times and clinic appointments are displayed in real time and available to all.
- All HCPs may be allowed to freely develop applications which may be utilised after due governance.
- Recommend the identification of individuals who support innovation and good practice in information technology and health informatics.
- Some people say, “data dumps are not helpful.” Instead, the technology should present data in a helpful, structured way.
- Is healthcare data really sensitive? — What would be the criminal motivation for hacking?
- There needs to be transparency, open governance, open standards.

3.2. Why do patients want access?

- Patients want a sense of control
- Patients may wish to review their advice with relatives (or they may not want to).
- Reviewing with relatives is normally good, especially with access to records.
- Ownership of information – linked to motivation, i.e., will use effectively
- Geographic efficiency of specialist advice
- Patient access to performance data
- Integration v security
- Data collection is important – avoiding repetition
- The technology is there but still the pen and paper is most flexible
- Perceived levels of trust
- Doctor patient relationship

3.3. Interesting web sites and examples of good practice

- Direct.gov has given us an example of open access to government sites and data.
- OpenEyes — an open source patient records system as an exemplar of a solution.
- Open source solutions — NHS open hack day.