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App Report

August 2020

What Is Hospify?

Ill-served by inefficient, out-dated communication tools like landlines, desktop email, faxes and bleeps, over **600,000 NHS professionals are currently using consumer messaging services like WhatsApp** to enable them to keep in touch more efficiently. But the arrival of **GDPR regulations** in May 2018 rendered healthcare institutions whose employees use these consumer tools to handle patient identifiable data liable for fines of up to 4% of their annual turnover.

Hospify solves this problem. It **is a simple & secure way of sharing sensitive & confidential health information between individuals, teams & communities.**

Our free messaging app can be downloaded from the app stores; the team messaging platform (the Hospify Hub and Web App) can be purchased by individuals or institutions who have a valid need to handle patient identifiable data (PID).

Together, the Hospify Mobile App, Hub & Web App combine the best of consumer tools like WhatsApp, LinkedIn and Slack, in a manner that's appropriate for use in health.

The free version of Hospify is available right now and is in daily use at over **200 clinical sites around the country** including London North West University Healthcare Trust, County Durham and Darlington, University Hospitals North Midlands, Frimley Park and Lincolnshire Community NHS Trust. It was the first and is so far the **only general messaging app to be approved by the NHS Apps Library for use by both patients and clinicians**,

Hospify is also backed by **Innovate UK, Wayra Velocity Health (in partnership with Telefonica and MSD Pharmaceutical), Kent Surrey Sussex AHSN and the UNISON and Managers in Partnership Unions**.

Please visit our website **www.hospify.com** or email **support@hospify.com** for more details or just download the Hospify app from your app store and give it a try for yourself.

Value Proposition

What is the problem/opportunity?

Ill-served by inefficient, out-dated communication tools like landlines, desktop email, faxes and bleeps, over 600,000 NHS professionals are currently using consumer messaging services like WhatsApp to enable them to keep in touch more efficiently.

Nearly one in five can recall instances where instant messaging has been used to supplement shift handovers, and more than 10% report that their use of instant messaging has included scenarios which had a direct impact on patient care in situations that include: the organisation of community care, processing referrals, asking for second opinions and developing care plans for inpatients & outpatients alike.

These responses suggest that current, NHS-preferred processes – the use of emails, bleeps, landlines and faxes - are not fast or flexible enough to cope with the difficulties frontline and support staff face in organising their time. By not providing compliant instant messaging, you are preventing staff from managing their time and resources as effectively and efficiently as they might otherwise do.

Furthermore, the arrival of GDPR regulations in May 2018 rendered healthcare institutions whose employees use consumer tools to handle patient identifiable data liable for fines of up to 4% of their annual turnover. This means that those 600,000 NHS staff using WhatsApp-like messaging services are putting their organisations at risk of data breaches and fines due to these apps not aligning with UK and EU health data protection regulations.

There were 1440 self-reported breaches in the NHS between 2014 and 2017 leading to fines of £1.3m. However, it is anticipated that there are unreported breaches exist in vast numbers. Research indicates[1] that more than a quarter (26%) of NHS staff use consumer messaging applications such as WhatsApp, iMessage, Viber, Facebook Messenger, Snapchat, Slack, Skype and Telegram for work purposes multiple times per day. Meanwhile, a total of 50% of NHS staff use these apps at least once per week.

In addition, those NHS employees who are aware of the potential breach are concerned about the delay in ability to communication with colleagues and patients if they do not have access to a secure method and one which enables them to communicate with relevant people who do not have an NHS email address.

Frontline clinical teams were found to be most heavily reliant on instant messaging, with 75% of junior doctors and 86% of doctors admitting they use these applications at least once a week. This supports the theory that instant messaging is much more vital to patient-facing staff, who are placed under an enormous

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[1] "CommonTime Report: Instant Messaging in the NHS": Christopher Martin et al., 2018

amount of pressure. However, this also amplifies clinical risk – as it is those who work most frequently with patient identifiable information transmitting data across non-auditable infrastructure most often.

What are the consequences of not providing the intervention?

The NHS is already the worst performing public sector body when it comes to data breaches, partly because unlike other public bodies it is mandated to report data breaches by the Department of Health. Anyone running a GP practice, a private health practice or a health trust must publicly report any data breaches that occur within their business and be liable to fines as a result – in addition to the knowledge of having compromised patient information.

Communication challenges will continue for those who are being compliant leading to a slow-down in communication which may affect urgent cases/rota changes etc.

An additional consequence of not having this specific compliant intervention is that those without NHS email addresses cannot be communicated with includes many groups such as private care providers and patients. This therefore means that even by using medically compliant apps, certain key groups will either not be included and users may revert to non-compliant apps for ease of use.

What is the (high-level) intervention/change?

Deploying Hospify is easy. Its technology is as simple and effective to use as common platforms such as Facebook Messenger and WhatsApp. Minimal to no training is required but can be provided to teams if necessary. There is no change in the patient pathway but just in the tool that is being used. A free version of the app can be downloaded to Apple and Android devices by users, and conversations can take place seamlessly from there.

The appropriate data protection officer (CIO/CCIO/Caldicott Guardian) should conduct a Data Protection Impact Assessment and amend relevant policies (e.g. BYOD) and public-facing notices (e.g. the institutional website) as required. Support for this process is provided if required.

If the web/desktop version of Hospify, the "Hospify Hub" is purchased, then additional support would be provided to the appropriate data protection officer on how they can manage the system most effectively to provide them with additional reporting tools.

What are the benefits at patient and service level?

The key benefit of this product is its ability to provide a solution which fully addresses the headache of NHS teams. Other tools can do this in part but with limitations which often result in the tool not being used and users reverting to more convenient consumer messaging services instead.

Core benefits include:

- Reduction of risk of data breach and reduction in risk of negative PR, patient distress and fines as a result.
- Allows more efficient communications, which enable clinicians, carers and patients to repond more quickly to situations involving their care and creates both time and cost savings for staff
- Cuts through a layer of administration, improving efficiency and reducing reliance on switchboard and legacy systems (landlines, desktop computers, faxes, bleeps etc.)
- Creates the possibility of communicating directly with the patient themselves, which is in keeping both with the NHS's ethos of empowering the patient and the Long-Term Plan's aim of increasing patient-centric care
- Allows the inclusion of "approved" people in groups who have responsibility for patient care, don't have an NHS email address, but yet are critical to the care of that patient (e.g. private care home teams, families, pharmacists etc.)
- Provides security controls and inter-institutional communication without fear of transgressing EU GDPR requirements.
- Offers an easy interface for broad spectrum staff communication and patient surveys (via the Hospify Hub).

In addition to the above there are net budget impact benefits. Analysis has shown that these would be as high as £801k in Year 1 rising to £1.167m in Year 5 for an exemplar community Trust, should it deploy Hospify for use by 51% of its staff.

This analysis was conducted by Kent Surrey Sussex AHSN and based on the assumption of realising benefits accrued from an improvement in communication time efficiency; represented in monetary terms by Time Cost savings. The findings showed significant non-cash releasing benefits of the deployment of an instant messaging system, such as Hospify, as clinical and non-clinical staff become less reliant on the current bleeper method and time is saved accordingly.

The NICE budget impact template[2] was used as a starting point to create a model for instant messaging systems and modified to fit the Hospify analysis. As there is no quantified evidence of Hospify working in practice within a community environment, results from external research on instant messaging systems were collected and used to show the potential outcomes.

The full Budget Impact Analysis is available for download from the Hospify website at: https://www.hospify.com/client-resources.

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[2] NICE: To support digital health innovators using the economic impact standards. https://www.nice.org.uk/about/what-we-do/our-programmes/evidence-standards-framework-for-digital-health-technologies

NICE Digital Standards

Hospify is compliant with the latest National Institute for Clinical Excellence (NICE) Evidence Standard Framework for Digital Health Technology (March 2019, https://www.nice.org.uk/about/what-we-do/our-programmes/evidence-standards-framework-for-digital-health-technologies). This framework was developed by NICE between June 2018 and February 2019 in collaboration with NHS England, Public Health England and MedCity. The work was commissioned by NHS England.

The framework describes standards for the evidence that should be available, or developed, for DHTs to demonstrate their value in the UK health and care system. This includes evidence of effectiveness relevant to the intended use(s) of the technology and evidence of economic impact relative to the financial risk.

The evidence standards framework is intended to be used by technology developers to inform their evidence development plans, and by decision makers who are considering whether to commission a DHT. As defined by these standards, Hospify is classified as a Tier 2 technology in the "Communicate" category:

Description	Includes
Allows 2-way communication between users and professionals, carers, third- party organisations or peers. Clinical advice is provided by a professional using the DHT, not by the DHT itself.	Instant messaging apps for health and social care. Video conference-style consultation software. Platforms for communication with carers or professionals.

Regarding effectiveness standards, the standard relevant to Hospify as laid out in Table 4 of the standard: "Evidence for effectiveness standards for tier 2 DHTs" is that of "Quality and safeguarding", which requires Hospify to:

> Show that appropriate safeguarding measures are in place around peer-support and other communication functions within the platform. Describe who has access to the platform and their roles within the platform. Describe why these people or groups are suitable and qualified to have access. Describe any measures in place to ensure safety in peer-to-peer communication, for example through user agreements or moderation.

In order to ensure this, Hospify has conducted a DCB0129 Clinical Safety Case report, and had an independent assessment of the service carried out by the NHS England-accredited review body ORCHA. See following sections for details.

Clinical Safety Case DCB0129

In line with the NICE guidelines, Hospify contracts a Clinical Safety Officer and maintains DCB0129 Clinical Safety Case Report that provides the assurances that the Hospify app is clinically safe in the context of the NHS Digital clinical safety standards.

The Clinical Safety Objectives for this application and associated documentation are:

- To ensure that the safety activities undertaken during the course of the clinical safety process are in line with the risk management plan
- The design, development and deployment has continued monitoring of the Hazard Assessment / Log
- Ensure the system is clinically safe in the context of its intended purpose or use
- Monitor any change to the system, assess any potential risk and mitigate these
- Identify and assess clinical hazards/risks to ensure patient safety
- Identify safety critical functionality of the system and evidence assurance activities in these areas to mitigate clinical risk
- The safety case report aims to provide part of the argument that the application complies with NHS clinical safety standards. As such it is deemed clinically safe and fit for purpose.

An additional assessment on applicability and scope within the context of the medical device regulations has also been completed.

Copies of Hospify's Clinical Safety Case Report, Hazard Log and Medical Device Assessment can be made available for review on request.

ORCHA Review

The ORCHA Review (https://www.orcha.co.uk/) is primarily an assessment of an App's compliance with current standards, regulation and good practice (together "Standards"). The higher the ORCHA Score achieved the more compliant the App is with these Standards. According to ORCHA's website, the ORCHA review "is the only truly comprehensive assessment of the Apps that are available in the two primary App stores' 'health, wellbeing/fitness and medical' categories."

Hospify Android App review

Hospify: Trusted Healthcare Messaging for Everyone
Version: 1.5.8 | Cost: Entirely Free

90%

Level 2 - General Health

SUMMARY | FUNCTIONS & FEATURES | DATA PRIVACY | CLINICAL ASSURANCE | USER EXPERIENCE | GALLERY

This App achieved an ORCHA score of 90%.

It was assessed as a Level 2 App. These apps are focused on general health. They may collect data and they may have a number of more advanced features. Where they collect data we assess their data use policies and compliance with relevant standards. Because they are health focused we also assess their compliance in the Clinical Effectiveness as well as the User Experience domains.

This App does collect data and it is therefore assessed and scored based on its performance in all the sections of our review.

Data Privacy	27.1/30	View details
Clinical Assurance	34.8/40	View details
User Experience	27.8/30	View details

DEVELOPER DESCRIPTION

Ill-served by inefficient, out-dated communication, over 600,000 NHS professionals are currently using consumer messaging services like WhatsApp to supplement communication. But the arrival of GDPR regulations in May 2018 rendered healthcare institutions whose employees use these consumer tools to handle patient identifiable data liable for fines of up to 4% of their annual turnover.

READ MORE

DOWNLOAD APP

Country:

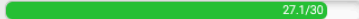| Category:	Clinical Reference
Released:	01/01/0001
Updated:	20/05/2019
Version:	1.5.8
Size:	100mb
Developer:	CSSL
Reviewed On:	29/05/2019

Scan the QR Code to open this page on your mobile device.

Full review online at:

https://appfinder.orcha.co.uk/review/42639/

Hospify iPhone App review

Hospify Healthcare Messaging
Version: 1.5.8 | Cost: Entirely Free

DOWNLOAD APP

Country:
Category: Clinical Reference
Released: 12/03/2014
Updated: 20/05/2019
Version: 1.5.8
Size: 85mb
Developer: CSSL
Reviewed On: 29/05/2019

Scan the QR Code to open this page on your mobile device.

89%

Level 2 - General Health

SUMMARY   FUNCTIONS & FEATURES   DATA PRIVACY   CLINICAL ASSURANCE   USER EXPERIENCE   GALLERY

This App achieved an ORCHA score of 89%.

It was assessed as a Level 2 App. These apps are focused on general health. They may collect data and they may have a number of more advanced features. Where they collect data we assess their data use policies and compliance with relevant standards. Because they are health focused we also assess their compliance in the Clinical Effectiveness as well as the User Experience domains.

This App does collect data and it is therefore assessed and scored based on its performance in all the sections of our review.

Data Privacy	26.8/30	View details
Clinical Assurance	34.8/40	View details
User Experience	27.6/30	View details

DEVELOPER DESCRIPTION

Ill-served by inefficient, out-dated communication, over 600,000 NHS professionals are currently using consumer messaging services like WhatsApp to supplement communication. But the arrival of GDPR regulations in May 2018 rendered healthcare institutions whose employees use these consumer tools to handle patient identifiable data liable for fines of up to 4% of their annual turnover.

READ MORE

Full review online at:

https://appfinder.orcha.co.uk/review/186774/

National Data Guardian Standards

The National Data Guardian (NDG) standards have been calculated for your organisation based on the responses provided in your organisation profile.

NDG 1. Personal Confidential Data	NDG 2. Staff Responsibilities	NDG 3. Training
Met (8 / 8) Not Met (0 / 8) 100 % complete	Met (2 / 2) Not Met (0 / 2) 100 % complete	Met (3 / 3) Not Met (0 / 3) 100 % complete
NDG 4. Managing Data Access	NDG 5. Process Reviews	NDG 6. Responding to Incidents
Met (3 / 3) Not Met (0 / 3) 100 % complete	Met (1 / 1) Not Met (0 / 1) 100 % complete	Met (3 / 3) Not Met (0 / 3) 100 % complete
NDG 7. Continuity Planning	NDG 8. Unsupported Systems	NDG 9. IT Protection
Met (3 / 3) Not Met (0 / 3) 100 % complete	Met (3 / 3) Not Met (0 / 3) 100 % complete	Met (2 / 2) Not Met (0 / 2) 100 % complete
NDG 10. Accountable Suppliers		
Met (2 / 2) Not Met (0 / 2) 100 % complete		

Solutions

The only platform designed from scratch for use across the whole healthcare sector, Hospify allows you and your team to safely move sensitive data, get fast feedback, accelerate integrated treatment pathways and quickly connect with sector-wide expertise.

Our free **Mobile App**, our subscription-based **Web App**, and our unique **Hospify Hub** combine to let you join and create easily accessible and fully networked communities within and across healthcare institutions - and can scale to any number of colleagues and patients in ways that can suit any budget.

And not only is Hospify the only messaging app approved by the NHS Apps Library for both clinicians and patients, it's also approved for sale on the five most important NHS procurement frameworks.

Mobile App

Everyone can use our free mobile messaging app. It's a simple, healthcare-bespoke alternative to non-compliant consumer messaging services like WhatsApp and Messenger that securely shares unlimited messages and photos between clinicians and patients. It segregates work from personal communications, so no data is shared inappropriately. And thanks to our unique, 'serverless' architecture, your data stays safely in your phone and those of trusted contacts you've shared it with.
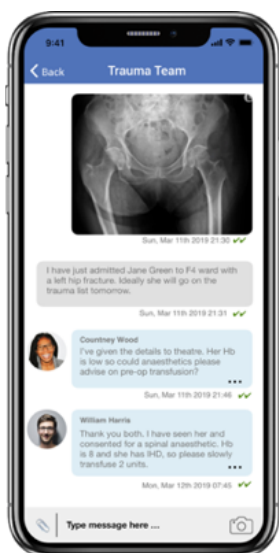
- **Instant set-up:** Download the app, add contacts and set up groups in minutes.
- **Unlimited text and photo messages:** Send as many photo and text messages as you wish.
- **Unlimited secure groups:** Create all the work groups you'll ever need.
- **PIN-code protected:** All messages are secured using a six-digit passcode unique to you. The PIN can be replaced with fingerprint/face recognition if desired.
- **Local storage:** All messages are stored in-device, not on our servers.
- **Auto-deletion:** All messages are auto-deleted after 30-days for maximum data security.
- **Accessible to all:** Clinical and non-clinical healthcare professionals and even patients can use Hospify.

Web App

The Hospify Web App is a unique data-compliant web-based version of the mobile app that syncs with your version on your phone but stores message data for longer and enables export and download of pictures and text.
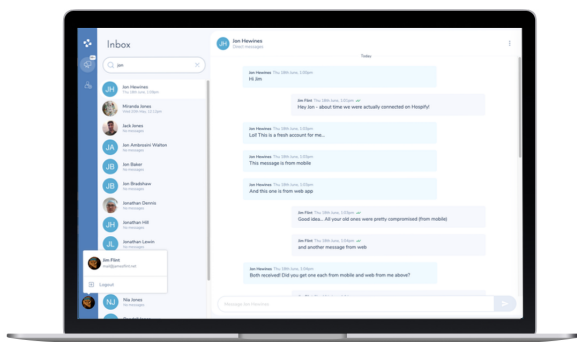

- **Auto-sync:** Syncs seamlessly with your mobile app, freeing you from your phone.
- **Browser-based:** Accessible from any modern browser via mobile, tablet or desktop.
- **Cloud storage:** Securely backs up all your messages to compliant cloud for the duration of your contract.
- **Data export:** Allows download of images & documents and copy/paste of text messages for simple and secure export to other applications.

Hospify Hub

The Hospify Hub (https://hub.hospify.com) is an online admin tool that allows you to bring teams together in one simple, compliant messaging system for both mobile and web. Create and coordinate your own Hospify community, provision staff with the web app, and communicate with your team using broadcast messaging and official groups. The features in the Hub also allow authorised administrators to have more direct control over NHS Information Governance and NICE Quality & Safeguarding requirements.
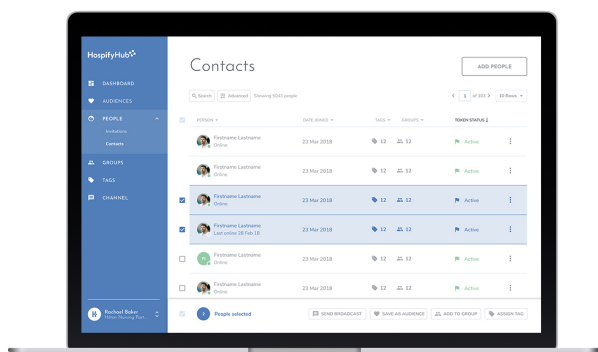
- **Easy onboarding:** Onboard colleagues and patients to your own Hospify community quickly and effectively; manage new starters and leavers.
- **Authorised groups:** Create branded groups authorised by your organisation and assign group moderators.
- **Broadcast messages:** Tag individuals and create audiences to broadcast messages and attachment with tracked delivered & read receipts.
- **Staff & patient surveys:** Gather feedback and opinion using our built-in survey tool and analytics dashboard.

Hospify Pricing

Because it stores all sensitive data in the phone, the Hospify Mobile App is always free for anyone to use. But our more premium features like the Hospify Web App and Hospify Hub store data in the cloud, and so we need to charge for those both in order to cover our costs and to verify the identity of our users, thus ensuring that proper data protection relationships are in place.

Having said that, Hospify is not expensive, is very straightforwardly priced, and is simple to purchase and scale up to any level of service requirement. You start by upgrading your Mobile App to a **Web App**, which costs just **£30 + VAT per year (or £3 + VAT per month)**.

Once you've got a Web App and can access your messages online you can set up a **Hospify Hub** and start your own Hospify team or community. **For each Web App user that you want to add to your Hub we charge the same £30 + VAT per year (or £3 + VAT per month), and for each Web App user that you add you can add 50 mobile-only Hospify users to your Hub for free**.

For organisations requiring more than 1000 Web App users, we can discuss **enterprise pricing options**, which are also available via the following frameworks:

- G-Cloud 11 & 12 digital marketplace
- Crown Commercial Service "Spark" DPS
- NHSX Clinical Communication Tools Framework
- London Procurement Partnership Health & Social Care Apps DPS
- Health Systems Support Framework

Case Study 1

Hospify secure messaging app enables real-time coordination of complex hip trauma surgery at Frimley Park Hospital
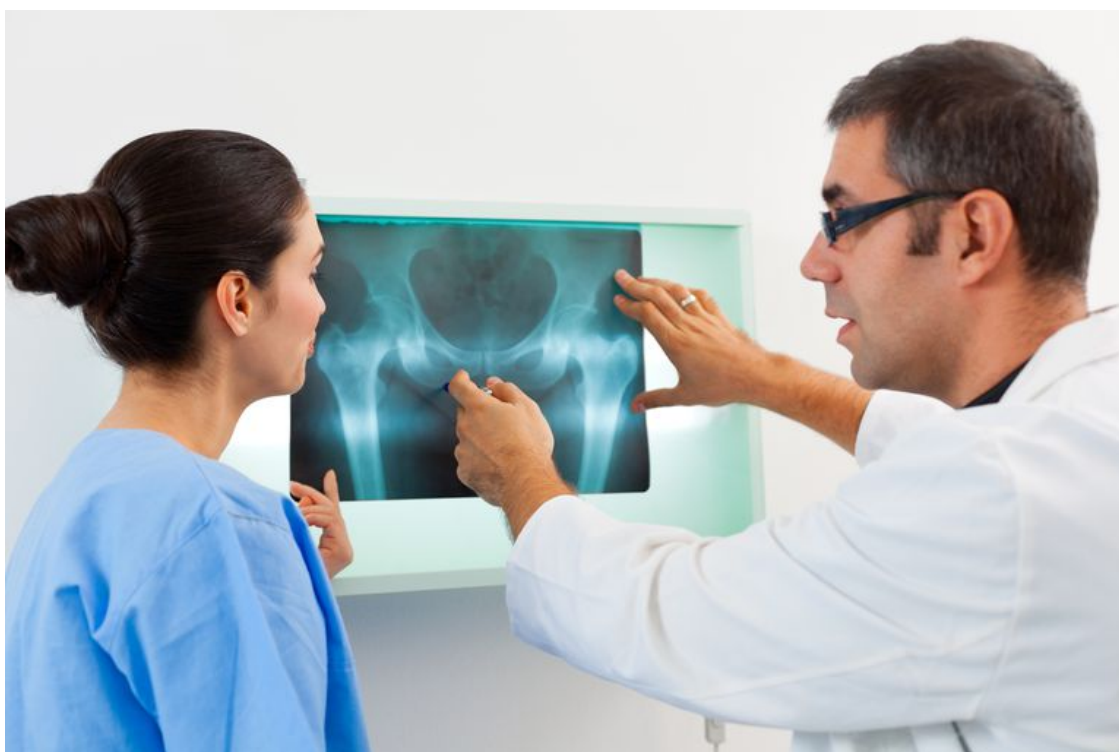
With rising pressure on NHS Trusts to provide excellent patient care while managing tight budgets and staff shortages, it's vital that hospitals can pull the right teams together quickly in emergency situations. At Frimley Park Hospital in Surrey, trauma teams responsible for coordinating and performing hip fracture surgery on elderly patients are now using a breakthrough mobile app to stay in touch with each other – securely, in real time – so that the right people can be mobilised immediately when a new complex case comes in.

Coordinating the best care

The hospital carries out more than 500 hip repairs annually. The typical patient is elderly and has multiple medical conditions. These need to be taken into account and appropriately managed as each individual is prepared for surgery. In a trauma situation, this multi-disciplinary input needs to be coordinated quickly to minimise delays to procedures and enable the best patient care. New cases could be admitted at any time of day or night.

Consultant anaesthetist Tim Pepall and his colleagues had been searching for a solution to real-time trauma coordination for years. "We had always felt they must

be a better way of communicating. Emails just don't cut it and chasing people individually can be very hard and time-consuming," he says. "In complex fractured-neck-of-femur surgery, there are lots of surgeons, anaesthetists and nursing staff involved. One person might know what's going on, but the issue until now has been how to efficiently bring everyone up to speed when people are in different places."

Hospify: secure instant messaging for medical teams

In 2017, Tim got word that a colleague elsewhere in the hospital, consultant vascular surgeon Neville Dastur, had developed a secure and compliant WhatsApp-style app for real-time group communication – called Hospify. He was keen to try it.

"Finally, here was a secure means of communicating instantly with colleagues – with the ability to share information in a compliant manner, monitor people's responses and have back-and-forth conversations in real time," Tim says. "And all teams need is their smartphones, something most people already have. It was the answer we'd been looking for."

The Hospify app includes a number of important and innovative features. One is its strict privacy controls. This means medical teams can confidently discuss patient cases using the app, without fear of transgressing strict requirements governing the sharing of confidential information.

Conversations conducted over Hospify are encrypted as they pass back and forth between team members and are deleted from Hospify's server network once they've been delivered. This means that the only copies of the messages are those held on devices of authorised staff. Just as importantly, message content never passes out of the EU as it travels over the internet, keeping the app compliant with new European data protection rules (GDPR), applicable from May 2018.

Other useful features include the ability to easily look up and connect with other clinicians and support staff via the in-app directory.

Instant responses enable faster decisions

Two trauma coordinators, one ortho-geriatrician, and nine trauma anaesthetists now use the Hospify app, and more than 20 consultant orthopaedic surgeons are due to adopt it imminently. "So all the people involved in surgery planning will be connected and able to communicate securely as events unfold," Tim says.

"This is transformational. It's like a bleep system for the 21st century – immediate, with the ability to communicate back and forth, and no guesswork about who's seeing and responding to messages. And because it's so secure, I can use it from home to see and respond to situations at any time of day or night. It's electronic communication at its best."

Simple & affordable

From a budgetary point of view, Hospify carries negligible cost because it is app-based and remotely hosted – so the hospital hasn't had to invest in any special systems, or user devices. "Best of all, it feels very familiar to users because of its similarity to consumer messaging systems like WhatsApp," Tim notes.

The benefits of Hospify are already widely felt in Frimley Park Hospital's orthogeriatric department. Patients admitted after hours can be successfully processed through the night and preparations made to enable surgery to be scheduled promptly for the next day – without the wait for key team members to arrive at work and be brought up to speed. Meanwhile trauma surgery coordinators can choose from a larger pool of anaesthetists because it's so easy to include everyone in the loop.

Glimpsing the future

"Hospify is a game-changer," Tim says. "I can see it catching on quickly in other departments and hospitals. It's something the medical profession has long needed," he adds, "and the fact that it was designed by a clinician - who understands our processes and the criticality of patient privacy/information governance - means we can have the confidence to use it when it really counts."

His team is excited about ongoing plans for Hospify too. The app now supports picture-based messaging, for example, so that clinicians can securely share X-rays and other medical images, further enhancing the ability to make critical decisions across distance. "We're only beginning to appreciate what's possible, but this is definitely the future," Tim concludes.

Case Study 2

Hospify secure messaging app simplifies specialist consultations, allowing GPs in Aldershot to triage patients more swiftly

Dr Nelly King is a busy GP at The Cambridge Practice in Aldershot. She is also a Macmillan GP facilitator and cancer lead for North East Hampshire and Farnham CCG. She divides her time roughly 75:25 between the two roles. Outside of work she is protective of her home life, so prefers to accomplish as much as she can for her patients during clinic hours.

Doing the best for her patients can involve consultations with colleagues and correspondence with external experts. Outside the practice, this would traditionally involve writing referral letters or emails, and sending over relevant notes or images to determine whether a specialist appointment will be needed, or what other course of action is advised. So when Dr King was approached to try a new secure messaging app called Hospify – a kind of WhatsApp for clinicians and their trusted colleagues – she was very interested.

Remote triage

The app's premise is that it allows instant, trusted communications between dispersed teams and extended clinical networks – with the ability to locate

specialist experts quickly and determine if they are free for a spontaneous consultation. Less intrusive than a phone call, and with the option to message several people simultaneously, Hospify offers to save clinicians a lot of time by enabling them to source quick answers at the time of need.

Dr King has also been an IT lead for her GP practice, so she was able to appreciate the benefits immediately, not least the ability to get up and running quickly without the need to buy and learn to use any special software. "We started by forming a group for our practice to share clinical input," she says. "GPs can ask each other for a quick second opinion, or share a medical image for their feedback, so it's already very useful."

The next use case she is keen to exploit is for connecting with other clinical experts in the local area. "If we can tap into broader clinical groups, for example a breast surgeon, dermatologist or podiatrist, we could start to triage remotely – share an image of a lesion, or check on a particular policy relating to vascular surgery, for example, and get a more immediate steer on whether a patient should be referred."

Reducing referral admin

Compared to the usual approach of dictating a letter or typing a letter between patients or after clinic sessions, the immediacy of using Hospify offers to cut through a layer of administration. "It simplifies the process and could mean faster results for patients," Dr King says.

In her Macmillan liaison role, Dr King recently took part in a pilot for a Virtual Multi-Disciplinary Team, giving her an insight into how MDTs might work across distance. But without an associated app, it could take four or five hours to collate and send all the relevant information to remote colleagues. "Although the intention was good, the process was frustrating and time-consuming. If the project had been supported by an app like Hospify, it would have been much more efficient," she notes. "Generally speaking, the NHS hasn't been very good at finding secure IT solutions that are easy for everyone to use. But we all have phones and Hospify capitalises on that and gets straight to what's needed."

The Hospify app, whose functionality is evolving all the time, includes a number of important and innovative features. These include the ability to easily look up and connect with other clinicians and support staff via the in-app directory. Then there are the essential security controls, so medical teams can confidently discuss patient cases using the app without fear of transgressing strict requirements governing the sharing of protected personal information.

Dr King says she is excited by the potential for Hospify across both of her roles – as a practising GP, and in her capacity as Macmillan GP facilitator and cancer lead for her local CCG. "As a real-time interface for sharing resources and instant advice, it's invaluable," she concludes.

Compliance and Security

Platform architecture overview

Hospify was designed in close consultation with the Information Commissioner's Office to ensure compliance with both UK data protection laws surrounding health data and the GDPR. The platform's architecture is specifically designed to significantly reduce the potential for security breaches and legal liabilities around patient data access requests.

Hospify Mobile App

1. Text messages

Hospify encrypts and delivers messages from phone to phone, using real-time PubSub servers and a SQL database for message queuing and longer-term message storage, when required (see Web App section, below).

Data in transit uses TLS 2048-bit encryption and is never stored in the message transit servers for more than 72 hours even if delivery fails. The SQL message queues will store messages that have not been delivered immediately for 72 hours to attempt redelivery; after 72 hours, if delivery has not been achieved then the message is deleted, and the sender is informed that delivery has failed.

Messages are automatically deleted from both sender and recipient phones after 30 days. Please note that the deletion process relies on a user opening and using the app. In theory if a user doesn't use the app then the messages remain. In this case, to access the encrypted messages a bad actor would both need to gain "rooted" access to the device and the encrypted message, and access to the private keys held in the phone's secure storage hardware, which isn't supposed to be possible even with a "rooted" device.

Hospify's user database servers are kept entirely separate from the message transit systems and the keys required to decrypt the message are stored separately from the encrypted data itself.

Hospify's servers are exclusively based in the European Economic Area, ensuring that all messages stay within that geographic zone. Similarly, the premise behind Hospify's approach to security is to keep all private data on the user's device and to do all encryption on-device before transmission.

On device the hardware security features are used to store sensitive information such as keys. We have implemented all standards using ephemeral keys to provide perfect forward secrecy too. AES256-bit encryption is used for data encrypted at rest.

PKI keys are stored in the phone's secure hardware environment, using Apple KeyChain for (iOS), or the class CryptoControl (Android). Any other data is

encrypted at rest again using AES 256-bit encryption. The app has its own PIN entry/biometric login screen and so does not rely on a user setting a PIN for the device itself. On device data is purged after 30 days - users cannot keep messages in Hospify any longer than that. None of the message content is shown in home screen notifications, which just tell you that you have a secure message in Hospify from a named individual but offers no further information about the message contents.

Hospify uses an Elliptical Curve Private/Public key infrastructure and AES 256-bit for the symmetrical encryption of the derived key. This design is driven by the best-practice standards and is very similar to the way https now works. All of the encryption takes place on the user's device.

2. Picture messages

For communicating picture messages, the app operates a dedicated picture server. Full resolution and thumbnail versions of the picture are encrypted and then uploaded to the server where they are kept, stripped of metadata, for a maximum of 32 days while awaiting download by the authorised recipient(s). Access to encrypted files is limited to authenticated users, and only the intended recipients have access to the decryption keys for each picture.

Pictures are taken by a camera accessed from within the app and are stored within the app so that they do not get inadvertently shared in a non-compliant fashion by the user's phone's picture cloud storage function. Screenshots are suppressed on Android phones (this functionality is not currently available in Apple iOS), to further discourage export of information from Hospify.

Hospify Web App

Hospify's Web App provides users with access to their messages via a web browser; as a result, it does not store any user or message data on the device as it may be shared with other users.

When sending messages, the Web App uses a Hospify API to encrypt the messages for each recipient and then the messages are sent directly to recipients using the same messaging transit system used by the Mobile App. As above, a copy of each encrypted message is stored in the central database.

When receiving messages, the Web App downloads encrypted messages from the central SQL database (access to messages is strictly limited to the intended recipients). Messages are then decrypted via a Hospify API before being displayed to the user. Messages are stored in the SQL database for a period of 12 months by default. Longer storage times are available as an additional premium feature.

In transit, text messages are encrypted as described above for the Mobile App. Picture messages also operate in the same way as described above for the Mobile App.

It is important to note the encryption and decryption algorithms work the same way as for the mobile app, through symmetrical keys but that encryption and decryption do not occur on the device itself. Messages are encrypted for each recipient and It is only possible to decrypt a message using the recipient's private key. However, a key difference from the Mobile App is that since the private key cannot be stored on the device, it is stored in a cloud database which is kept isolated from any other message or user data. This private key is not transferred to the browser and can only be accessed or used by the API server.

Hospify Hub

The Hospify Hub is an online admin portal that enables organisations to manage their users and groups; it also allows them to broadcast messages to "Audiences" (i.e. tagged segments of their user base).

The Hub is accessed via a web browser and does not store any data on the device. It only provides access to user data via a Hospify API and is not able to access any messaging data.

Broadcast messages sent from the Hub are not encrypted and are stored in a database. Broadcast messages are not intended to carry sensitive information or patient identifiable data. Access to broadcast messages is limited to the intended recipients.

All data in transit to and from the Hub are protected by SSL and by a multi-tenant authentication system.