

# **Medinz: an assessment of an inter-organisational communication tool**

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## Executive Summary

The aim of this report is to describe the barriers and solutions to effective communication between New Zealand health authorities and primary care providers during an emergency. We offer recommendations for improving communication, and therefore patient and clinician safety and trust. As part of this work, we have assessed the effectiveness of Medinz, a cloud-based system offering synchronous (real-time) and asynchronous communication between health authorities and primary care providers.

Developed out of a collaboration between social enterprise organisation [Healthpoint Ltd](#) and Waitematā District Health Board (DHB) in 2016, Medinz has been in use across the Auckland region since August 2017. It is currently being rolled out in other areas of the North Island. In the Auckland region, Medinz has become the gold standard of emergency communication for primary care clinicians. Messages sent to providers in order to test the channel's efficacy garnered an 89% response rate from general practice.

In assessing available communication tools, we identified a number of barriers that challenge communication efforts between health authorities and medical practitioners. We found evidence of:

- Messaging overload for recipients (too much content from too many channels)
- Confusion for senders and receivers regarding message priority
- A lack of accountability for senders

The key features of Medinz which **minimise risk** are:

- Streamlined clinical information distribution: **fast and clear**
- Governance and accountability for senders: **valid and accurate**
- Message prioritisation: **urgent, important, timely, actionable**
- Primary care focus: **need to know vs nice to know**
- Cost-effective: **saves time and money**
- Two-way communication: **feedback and clarification pathways**
- Flexible delivery options: **synchronous and/or asynchronous**
- Reliable execution: **secure**

We conclude with a recommendation to implement Medinz, or similar single-channel systems, across the primary health sector. Informed by robust operational and governance criteria, Medinz is a trusted communication tool that can deliver and ensure clear, consistent, and credible communication and has the potential to be used around and beyond New Zealand.

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## Introduction

In this report, we describe the key communication barriers facing New Zealand healthcare authorities such as Primary Health Organisations (PHOs), District Health Boards (DHBs) and primary care providers (e.g., GPs, clinicians, midwives, pharmacies, laboratory sector) and suggest potential solutions.

Based on feedback provided by users in Auckland and around the North Island, we find that the communication tool Medinz not only addresses but overcomes many of these barriers.

### 1. Context

In an emergency, effective and timely communication is crucial for facilitating an appropriate response. In public health emergencies, primary care providers act as first responders and trusted sources of information for the general public (Baseman et al. 2013, as cited in Kearsley & Duffy 2020). However, the ability of the primary care sector to respond to an emergency and thus uphold patient safety is limited by the quality of communication its providers receive.

The “quality of communication” is not just about the content of the message; it also includes the way the message is delivered (the “format”) and how reliable that delivery system is (the “system characteristics”) (Revere et al., 2011, as cited in Glatman Freedman et al., 2020). As identified in the literature, the inadequacy of existing communication channels has significant implications for patient safety.

### 1.1 Information overload

Many clinicians report they feel overwhelmed by the volume of public health messages sent to them (Staes et al., 2011, as cited in Taber et al., 2021), and their ability to recall the message content diminishes with every additional message received (Baseman et al. 2013, as cited in Kearsley & Duffy 2020).

While organisations can easily deliver messages into the inboxes of healthcare providers, they cannot reliably measure how (or if) recipients understand or engage with the messages. Information that is either unclear or goes unread fails to assist clinicians and their patients. To improve sector-wide communication, the quantity of information must decrease while the quality of information must increase.

One of the problems with existing public health emergency communication is that information comes from many sources (e.g. government, funders, PHOs, professional bodies) and is delivered across many channels (e.g., websites, mailing lists, SMS alerts, faxes).

As the number of communication channels increases, so does the potential for delivering conflicting or inaccurate information (Revere et al., 2011, as cited in Glatman Freedman et al., 2020). Therefore, streamlining communication through a single channel can reduce the risk of poor quality communication. In the Auckland metro region alone, there are three District Health Boards (DHBs) and eight Primary Health Organisations (PHOs), providing ample opportunity for conflicting messages.

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A collective commitment to a unified solution is required to avoid “information chaos” — information scattered across multiple channels that is redundant or conflicting. Information chaos may impair situational awareness and increase mental workload (Beasley et al., 2011, as cited in Steinkamp et al., 2021).

### **1.2 Need to know vs nice to know**

The task of deciphering the priority of different messages usually falls to the recipient. Widely accepted signals of high priority, such as all-caps email subject lines, use of exclamation marks, and keywords such as “action required” or “urgent” are largely unregulated. The result? Both clinically relevant and irrelevant messages can command the same attention in clinicians’ inboxes.

Email is a preferred method of communication for public health (Khan et al., 2017; Revere et al., 2015; Revere et al., 2014), but it also has some shortcomings. For example, mailing lists that require providers to “opt-in” may not reach everyone in the sector; these mailing lists are often plagued by bounced messages and outdated contact details (Baseman et al., 2016). In addition, although email has the capability for two-way communication, the anonymity of “do-not-reply” addresses leaves clinicians unable to seek clarification. Within this context, health authorities cannot be confident that emergency messages have been disseminated, received, or understood by all providers.

At times, the media publish news before clinicians have received appropriate updates (Kunin et al., 2015). An essential part of

the trust relationship between patient and provider is an expectation that providers have the necessary expertise to provide appropriate care. But if the communication of information to health providers is not timely, practitioners may be unaware of recent developments and advice and may feel ill-equipped during a patient consultation.

Staff shortages, the rapid emergence of new research, and ongoing pandemic updates have further exacerbated the experience of “time poverty” across the sector.

To help overcome these barriers — from unreliable delivery systems to unnecessary or unclear messages — communication within and across the primary health sector must be streamlined, comprehensive, and relevant. This enables critical information to rise above the noise and prompt a timely and appropriate response.

### **1.3 COVID-19**

The COVID-19 pandemic has highlighted shortfalls in emergency communication systems. Repetitive messaging about continuously updated guidelines has exacerbated “messaging fatigue” (Koh et al., 2020). Since it emerged as a pandemic in 2020, COVID-19 has dominated all media (Hong & Kim, 2020), and many clinicians have become desensitised to receiving multiple updates.

In addition, contradictory messages from various groups and individuals amidst the pandemic can help undermine the credibility of authorities. Therefore, widespread misinformation necessitates a unified response from the health sector. If individual

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primary care providers deviate from the latest governmental guidance, public confusion increases and levels of trust in authority figures can fall.

The harmful effects of information overload and poor communication on the public in the pandemic setting has been discussed in the literature. However, it is unclear whether we can extend the conclusions drawn about the general public to the health care provider population. Providers may have more knowledge about where to seek relevant and reliable information, but they remain limited by time constraints and heavy workloads.

## 2. The significance of quality communication

To our knowledge, there has been no evaluation of public health emergency response and preparedness communication systems in New Zealand. Given the importance of quality communication to primary care providers during a public health emergency, it is imperative that communication systems are optimised.

Poor communication from health authorities to providers increases the burden on already stretched healthcare workers. Currently, it is up to the providers themselves to prioritise relevant messages from a seemingly bottomless inbox. Poor communication to providers also limits the quality of care they can offer patients. A lack of clear, consistent messaging from those in positions of authority increases confusion amongst providers, which in turn can create confusion for patients seeking health information from clinicians.

## 3. Communication solutions

Clinicians want information that is clear, actionable, and locally relevant (Aakre et al., 2019). This has become especially important during the COVID-19 pandemic, where guidelines often differ by region and are updated frequently. This climate of changeability underscores the value of a streamlined and robust communication channel that delivers key information in a format that aligns with the needs of the users.

### 3.1 Flexible communication

**Synchronous** communication channels involve information exchange in real-time; telephone and video calls are synchronous. While they enable concerns to be instantly addressed and clarified, synchronous communication channels do not always allow clinicians to easily refer back to the original information source. For example, recalling the content of a phone conversation relies on the clinicians' memory whereas, in recalling email content, the clinician can re-open the email to supplement memory gaps. In addition, synchronous communication is inherently interruptive, and these interruptions can hinder healthcare providers' productivity. (Coiera, 2006)

**Asynchronous** forms of communication, such as email, SMS alerts, and website content, may enable clinicians to seek information in their own time rather than interrupting their workflow (Coiera, 2006). However, a drawback of asynchronous communication is the challenge for senders to ensure their messages have been received in a timely manner. For example, updated guidelines could sit on a webpage for

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any length of time before being seen by a clinician. While organisations can track page views, they cannot measure how widely those views are shared across the provider population.

Neither the synchronous nor asynchronous modes are sufficient to create a robust system. The agility and traceability of synchronous messages, in combination with the time flexibility and information fixity of asynchronous messages, can produce a higher quality of communication than either form in isolation. In addition, while interruptions can negatively impact workflow, they may be necessary to enforce rapid changes to practice in an emergency context.

Regardless of the channel — SMS alert, fax, or phone call — resilient emergency communication tools must be impervious to system failures, such as power outages or crises that occur outside of normal business hours.

### **3.2 Two-way communication**

A clear channel for communicating is essential to ensuring primary care practitioners feel they can confidently act on the information they receive. It is also important that providers can offer feedback and information — including at-the-coalface updates to help health authorities better understand and respond in real-time to unfolding emergencies.

This kind of two-way system provides health authorities with information (e.g., questions, concerns, praise, and surveillance) that means they can continuously improve communication with primary care providers.

Finally, a transparent communication channel that allows organisations to see messages sent to providers from other organisations can help reduce the level and impact of redundant and conflicting messaging.

All these solutions share a single truth: Inter-organisational coordination is the key to minimising or preventing information chaos.

## **4. Medinz**

As noted previously, Medinz is a cloud-based system for communication between health authorities and primary care providers that features synchronous and asynchronous means of communication.

Our report finds that, during critical events such as a pandemic, Medinz can overcome communication barriers across the primary care sector.

### **How does Medinz work?**

Medinz messages are sent directly to users via email, SMS alerts and fax. The method and timing of delivery depend on how a message is categorised by the author, in accordance with Medinz publishing guidelines.

The following table (Table 1) describes these guidelines and provides examples of messages that might be assigned to each priority category. Screenshots of real messages sent through Medinz at each priority category follow the table.

Table 1: Message Categories

Message Type	Scheduling	Delivery Method	Example
<b>Critical</b>	IMMEDIATELY Sent 5 minutes after being published on the Medinz dashboard.	All methods (fax, email, and/or SMS)	<i>North Shore Hospital ED closed due to flooding, divert patients to other EDs</i>
<b>Urgent</b>	DAILY Released at either 7:30AM or 12PM	Email or SMS (user choice)	<i>Auckland Regional HealthPathways: pathway updates</i>
<b>Routine</b>	WEEKLY Single collated message at 10AM on Tuesday mornings	Email (users can opt-out)	<i>Auckland Regional HealthPathways: pathway updates</i>
<b>Professional Development</b>	WEEKLY Single collated message at 10AM on Thursday mornings	Email (users can opt-out)	<i>Auckland DHB is hosting an open evening: "Women's Health": on 15/10/21</i>



## 4.1 Good governance

In addition to providing senders with clear categories for prioritising messages, Medinz publishing guidelines require every message to list an author and a contact email address to facilitate two-way functionality and create accountability for organisations. The contact email must be for an individual as opposed to a generic account from the organisation. Thus, message senders are accountable for the quantity and quality of content they disseminate.

## Critical messages

“Critical” messages are defined as containing information that may impact a health professional’s discussion with their next patient. For example, a “critical” message would be used in the case of a natural disaster such as a tsunami. Medinz users receive “critical” messages via all the contact channels they have provided (e.g., fax, email, SMS alerts) to ensure failsafe coverage when some delivery methods may be compromised by power outages or staff being off-site.

Table 1: Message Categories

< DASHBOARD


### Spark related incident impacting the CONNECTED HEALTH network

**CRITICAL**

There is a Spark related incident impacting the CONNECTED HEALTH network and as such there is a delay in the delivery of documents via HealthLink.

The following documents will not be delivered until the issue is resolved:-

- Soprano Medical Documents
- Maternity Records
- Mental Health Service
- Soprano Medical Templates
- Endoscopy Service
- Cardiology Service
- Radiology Service
- Newborn Service
- Histology Cytology Reports
- Centricity Cardio Workflow
- Prosolv Reports

Mahitahi Hauora



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Posted Friday 23 October 2020  
12:27 PM

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Author

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Was this useful?  0  0

## Urgent messages

Messages assigned as “urgent” are considered important for a health professional to know about within 24 hours. These messages are sent by email or SMS alert depending on user-indicated preference. “Urgent” messages are published to the online dashboard immediately and then collated and disseminated either at 7.30am or 12pm. Collating messages minimises interruptions to providers’ workflow and takes up less space in their inboxes.

Image 2: Example Urgent Message

### Heightened suicide risk in vulnerable populations

**URGENT**


A [redacted]-year-old female from [redacted] school died from suspected suicide on [redacted].

The fast dissemination of this kind of news via social media adds to the risk of contagion and further suicide attempts by vulnerable young people.

Please keep this in mind during your daily dealings with patients of this demographic and follow normal referral processes to mental health services where appropriate.

For non-acute situations, consider using the Need to Talk option – free call or text 1737.

See: [HealthPathways - Suicide Prevention in Youth and Youth Mental Health Counselling and Therapy](#).

 Auckland and Waitematā DHBs

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Posted [redacted]

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Author [redacted]



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DHBs Auckland DHB  
Waitemata DHB

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Regions Central Auckland  
North Auckland  
West Auckland

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Was this useful?  2  0

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## Routine messages

“Routine” messages have replaced GP newsletters and convey clinically relevant information that is not considered time-critical. Messages in the “routine” category are published directly to the online dashboard and then collated and sent out weekly as a single email. Recognising the relatively low priority of these messages, the Medinz system allows users to opt out of routine messages.

### Image 3: Example Routine Message

## Auckland Regional HealthPathways: pathway updates

ROUTINE

### 1. [COVID-19 vaccination information](#)

Updated to include information about obtaining proof of COVID-19 vaccination for travel. See also [COVID-19 Vaccination Preparation and Aftercare](#) for information on COVID-19 vaccination catch-ups for people who have received a first dose overseas.

### 2. [COVID-19 impact on clinical care](#)

A clinical editor's note has been added to this and other relevant pathways to highlight the rare, vaccine-induced Thrombosis with Thrombocytopenia (VITT) which may be encountered in arriving travellers who have been vaccinated overseas with other vaccine types. Heparin and Enoxaparin are contraindicated in VITT.

### 3. [Gallstones](#)

Adjusted to clarify the role of POAC. POAC can be initiated for:

- extended observation time that may be required to achieve pain relief
- clinical review if pain has settled but recurs in the acute episode
- ultrasound scan if pain recurs or if there are markedly abnormal LFTs on investigation (even if the pain has settled).

### 4. [Dyspepsia and heartburn/ GORD](#)

The treatment of H Pylori has been updated. GPs should be aware of red flags and risk factors associated with gastric cancer. See also some recently localised pathways:

- [child with a limp](#)
- [ectropion and entropion](#)
- [eyelid lesions](#)



Posted Tuesday 3 August 2021  
06:56 AM

Author [Redacted]

DHBs Waitemata DHB

Regions North Auckland  
West Auckland

Was this useful? 0 0

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## Professional development messages

Medinz also allows for messages which promote upcoming, continued education opportunities. Like the “routine” messages, “professional development” messages are collated as a weekly email that users can opt out of receiving.

The Medinz online message repository provides an asynchronous platform where messages are published and available for clinicians to access at any time. Messages are displayed on the dashboard for a predetermined period and then archived. Clinicians can use a search function to find archived messages should they wish to refer to them.

To optimise navigation, the dashboard is organised by priority, ensuring critical messages are published in red at the top of the screen. The online repository is accessible via the Medinz website and various practice management systems (e.g., Medtech). The message repository reduces the “scattergun” approach to dissemination by collating all clinically relevant information in a single online location.

Users can provide feedback through a free-text box on the website, by using thumbs-up/thumbs-down rating buttons, or by contacting the message author directly. The integration of direct feedback pathways also allows for surveillance, such as checking vaccine stock across general practices or identifying pharmacies that have lost power during a storm.

## 4.2 Testing the system

Medinz was put to the test with a series of trials to determine its efficacy in an emergency. Test messages were first used by DHBs in November 2017 and then by PHOs in May 2019.

Of the 289 general practices that received the PHO test messages, 89% responded — 79% within two hours — which we consider a very high response rate for the sector.

Testing was repeated in November 2019, this time outside of office hours on a Saturday afternoon, allowing organisations to build a picture of the coverage their messages could have in the event of an after-hours emergency.

Responses varied across different PHOs, from 81% to 100%. One PHO, Comprehensive Care, achieved a 100% response rate for their practices.

Image 4: Example Test Message

## This is a Regional Emergency DRILL for General Practices – your response is required by 4.30pm TODAY.

**CRITICAL**

**\*\*THIS IS A TEST MESSAGE. RESPONSE REQUIRED BY 4.30PM TODAY\*\***

The Medinz emergency communication system is being tested 'out of hours' as emergencies don't always happen during work hours.

Please acknowledge receipt of this message by responding as soon as possible by 4:30pm today, with answers to the three questions below:

1. What is your practice name?
2. What is your role? – e.g. GP / Nurse / Admin
3. In a real emergency situation, could you get to your practice within 1 hour to assist if required? Yes or No.

### **Example of a reply:**

1. Practice ABC
2. Nurse
3. Yes

### **You may respond by:**

- Sending an email to [Emergency@alliancehealth.org.nz](mailto:Emergency@alliancehealth.org.nz)
- Using the 'Respond to this message' function at the bottom of this email



Alliance Health +

Posted Saturday 2  
November 2019  
02:26 PM

Author

Was this useful? 0 0

**Table 2: Test Message Results Wednesday 15 May 2019, 10AM**

<b>PHO</b>	<b>Number of Practices</b>	<b>% Practices Responded</b>
Alliance Health +	34	82%
Auckland PHO	24	83%
Comprehensive Care	41	95%
East Health	20	95%
National Hauora Coalition	No message sent	
ProCare	170	89%
<b>Total/Average</b>	289	89%

**Table 3: Test Message Results Saturday 2 November 2019, 2:30PM**

<b>PHO</b>	<b>Number of Practices</b>	<b>% Practices Responded</b>
Alliance Health +	36	81%
Auckland PHO	Data not available	Data not available
Comprehensive Care	41	100%
East Health	Data not available	Data not available
National Hauora Coalition	Data not available	Data not available
ProCare	170	82%
<b>Total/Average</b>	247	88%

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### 4.3 Stakeholder engagement

A wide range of stakeholders was engaged in the development of Medinz. Over 40 workshops were held, and over 50 general practitioners engaged in the process. Bringing primary care stakeholders on board from the early iterations of Medinz has allowed for the creation of a tool uniquely targeted to the sector.

In 2021, we surveyed health providers who use Medinz about their comparative communication experiences before and after Medinz was implemented.

### 4.4 Positive user feedback

Before the implementation of Medinz, many primary care providers were overwhelmed by communication. As the following comments make clear, providers felt there was simply too much information coming in for them to manage.

“...every Tom, Dick and Harry wanted to send stuff to GPs. What they didn’t realise was that the poor GP was absolutely getting swamped with information”.

“They only saw the information they were sending out, but at the receivers’ end, we were getting messages from all over the show.”

In addition to information overload, providers reported that a range of factors contributed to communication. One of these factors was a difference in what health authorities and primary care providers considered “important” information.

“Everyone thought their information was the most important information that GPs needed, which was often not correct. It was the information that *they* thought was important rather than what general practice actually needed.”

The introduction of Medinz helped health authorities communicate with providers using a consistent definition of “priority” for all messages.

Another issue with the system prior to Medinz was its limitations for emergency communication. Pre-Medinz systems such as fax “only worked in office hours between 8.30am and 5pm, Monday to Friday”.

PHOs had systems of their own in place to communicate with their practice networks “... but [there wasn’t] a sort of single source of urgent communication tool that would cover all of Auckland and all of primary care”.

The implementation of Medinz required organisations to commit to this system as their dedicated communication channel.

The COVID-19 pandemic highlighted the positive impact of Medinz for the primary health sector. The pandemic brought with it volumes of information that did not always align across different sources.

“There was Ministry of Health info, and then we had our regional info, and the media were saying something different so from our GP clinicians’, our network practices’ perspectives, that was a bit confusing.”

<sup>1</sup> Quotes were received from Auckland GP Dr. John Cameron, ProCare Clinical Director Allan Moffit, and Former ProCare Head of Communications Sherryl Arneil.

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Medinz became a trusted, single source of truth when guidelines were rapidly changing, and providers had to adapt swiftly to the latest best practice.

“The pandemic showed how useful this tool was.”

“It’s stood its stead definitely over the COVID response, and hopefully it will go into the future.”

DHBs and PHOs recognise the usefulness of Medinz as a two-way tool that allows them to gain valuable on-the-ground information in times of crisis.

“If we set it up, we can actually get the information we want at the same time, so it’s a two-way communication stream as well. It’s not just a one-way thing.”

“We had an incredibly high response rate when we tried it out as an emergency sort of text and asked practices to respond.”

## 5. Limitations

Implementing direct feedback pathways and accountability structures that ensure compliance with guidelines will carry a significant time cost up front. Some organisations may find that the restrictions on communication under the Medinz guidelines require them to readjust how their communications teams operate. For example, Medinz requires that messages sent at critical, urgent, and routine categories are clinically relevant and will impact clinicians’ consultations with patients.

There remain disparities among stakeholder groups of how to prioritise and categorise their messages on the scale of “routine” to “critical”. What seems important from a DHB perspective, for example, may not be as relevant for the primary care audience. These differences provide further reason to implement strong feedback pathways that allow stakeholders to build an improved understanding of each other’s perspectives.

## 6. Conclusions

Despite its importance, there has been little documentation or evaluation of communication systems between health authorities and primary care providers. Ongoing development, improvement, and evaluation of these systems is required to better protect patient safety.

However, our findings clearly indicate that Medinz provides a single-channel solution to help streamline and enhance communication. Through its flexible approach to content delivery (synchronous and asynchronous), reciprocal feedback pathways, transparency, good governance, sound operational criteria, and capacity for continuous improvement, Medinz is a robust system that has the potential to be used in other jurisdictions.

## 7. Recommendations

Our report shows that, within the context of patient safety, the inadequacies of the current communication approach cannot be tolerated. We also find that, following



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the implementation of Medinz, there were significant improvements in communication in the Auckland region.

Thus, we recommend that other regions, in and beyond New Zealand, consider implementing Medinz or a similar system at the interface of health authorities and primary care. For health authorities considering a new approach to communication — whether through Medinz or another channel — we make the following recommendations.

### **Streamline your communication channel/s**

Disparate channels should be merged into, or superseded by, single-channel solutions to eliminate conflicting or redundant messaging. It is important that organisations collaborate to ensure communication is streamlined.

### **Be collaborative**

Collaboration will be crucial for the successful implementation of improved communication systems in the health sector. Leaders across the sector must reimagine healthcare and bridge the silos that divide the system.

### **Develop guidelines for best practice**

Good governance, including for content development and dissemination, is crucial to building, maintaining, and monitoring effective communication across the sector. Particular care must be taken to avoid the overuse of “critical” and “urgent” labels. Appropriate use of these labels ensures that they are effective and trustworthy. We acknowledge that one-way communication systems have

likely persisted due to their ease of use for message-senders. However, we believe that restrictions imposed on communication under communication guidelines are necessary for the protection of clinicians and their patients.

### **Understand your users**

We encourage the sector to adopt a communication system that is responsive to user feedback. Mechanisms for such feedback are key to ensuring communication channels can evolve as users’ needs change. Feedback is vital to preventing new communication systems from becoming part of the information overload problem they are designed to solve.

## **8. Acknowledgements**

### *Conflict of Interest*

Healthpoint Ltd gave an unconditional grant to the University of Auckland to cover the summer studentship of one author (DL). The intellectual responsibility was and remains solely that of the University of Auckland

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