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‘Educating RITTA’: Evaluation of an Artificial Intelligence Programme in Opioid Prescribing - A Pilot Project and Needs Assessment

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Background/aims: Through a person centred, design thinking process, our cancer hospital palliative care team in conjunction with IBM Watson developed an Artificial Intelligence (AI) enabled virtual assistant, trained in giving basic advice on opioids. This dialogue agent is currently trained to answer a limited number of patient generated queries to demonstrate capability. Our patient/carer group suggested a hospital virtual chatbot, that could answer queries at any time of day or night.

Methods: Patients, carers and healthcare professionals were tasked with creating common queries and answers around opioid prescribing. Questions and answers were programmed into the IBM Watson machine learning appliance ‘RITTA’ (Realtime Information Technology Towards Activation) with help from IBM IT engineers.

Results: Phase 1 testing results: 10 patients in a palliative care outpatient clinic who had recently been prescribed opioids, were invited to write down questions on the topic of these medications in palliative care. These queries were put to RITTA after the first programming phase. 50% of questions were answered well, with further programming needs identified due to language specifics, human misspellings, dialects, jargon and variations. Programming weaknesses were also identified.

Conclusions: A key theme in the development of AI is the time, care and resources required to develop Machine Learning (ML) layers. Technical work included expanding patient generated queries and machine learning in areas like palliative opioid prescribing, where a lot of repetition occurs and human medication errors or omissions can happen repeatedly and cause harm. Machine learning in palliative care has potential, but will require significant time commitment to enter thousands of question/answer variations, even for small topic areas. We identified a need for local language, slang/dialect programmes, as well as check systems on how up to date clinical guidance remains.

Summary:

This project describes first experiences utilising machine learning to enhance personalised patient centric care through RiTTa (Realtime information Technology Towards Activation). One of the arms of this project was an opioid information application that could replicate some parts of a clinician/patient interaction.

It is as important as ever to be focussed on patients – especially in this newer application of machine learning using natural language processing (NLP). This project is about using technology to activate and engage people, supporting them live lives, improving their understanding of their condition and helping them spend much less time running around the health service seeking answers to their questions.

The real 'Rita', on whom this system is based, supports patients answering questions from hundreds of patients a day. She is a receptionist at the cancer centre. Though dedicated, she is not available 365 days a week, 24/7. However, patients living with cancer often come up with important questions outside the nine to five working day.

RiTTA is the world's first virtual assistant trained in answering some questions that oncology and palliative care patients might ask. She is able to provide real time answers to a stream of common questions at any time of the day or night.

Importantly, these are conversations, with tailored answers, not just a directory of

information. Patients with cancer have been very involved in this project from the beginning, and helped to bring a patient perspective to RiTTa's development. Supportive companionship is vitally important.

The palliative care opioid section of this project required a lot of input, including commonly asked questions from patients. These had already been collated at the start of the project, including questions about dosing when newly starting on morphine, for instance. But there are other questions, that patients may forget to ask, for instance: "Can I still drive when I am taking Morphine?" or "Can I drink alcohol?".

Ten patients from a palliative care questions provided questions they might ask such a platform, and these were tested on the RiTTa system. 50% of the questions were answered well, with the remaining 50% needing further work. This highlighted the hard work that has to go into pre-programming such a system, and allowing for patient spelling mistakes and even regional accents and dialects.

Machine learning behind RiTTa provides the answer to 'What if' questions guiding patients to an answer or further help. Through previous research conducted in the area, it was clear that many patients wanted answers to certain queries outside normal working hours.

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