

RESEARCH ARTICLE

SURGICAL "HOT" TELEPHONE CLINIC: A SAFE ALTERNATIVE TO FACE-TO-FACE "HOT CLINIC"

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Manuscript Info

Abstract

Manuscript History Received: 30 November 2022 Final Accepted: 31 December 2022 Published: January 2023 **Introduction:** With increasing patients presenting to the accident and emergency department, the use of virtual clinics has shown promising results in medicine to help safely review these patients while avoiding admissions. These clinics often use the same staff and resources being utilised by theemergencyadmission team – this is especially true in the surgical admissions unit. We present data showing that "Virtual Clinics" (VC) are safe alternatives, improving patient service and relieving a significant burden on the acute surgical units.

Method: Baseline assessment of the virtual clinic was carried out over a 4-week period, between 23rd December 2020 and 19th January 2021. The virtual clinic reviewed 78 patients within this 4-week time period. Parameters for data collection included; admission dates, scan date, call-backs, diagnosis, referral patterns, readmission rates and eventual outcomes for those who needed surgical interventions. Reassessment of practise was undertaken in August 2021 following the introduction of a registrar led electronic virtual clinic.

Results: Assessment of practice showed that 83% of assessed patients had radiological imaging within 72hours with 89.7% of these scans having reports generated on the same day. Following incorporation of an electronic virtual clinic, 112 patients were reviewed over a 4-week period. Results showed a similar trend in terms of frequency of scans requested with zero failed discharges from the service.

Conclusion: The virtual clinic provides a safe and efficient method for the review and management of ambulatory patients in whom semiurgent investigation is needed but admission is not necessary.

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Introduction:-

A patients journey to the general surgical team usually takes places in the accident and emergency department [1]. However, an increase in the number of patients presenting to the accident and emergency department, combined with national targets of a 4 hour wait time in the accident and emergency department [2] has led to specialist units being set up. The aim of these units is to help triage and review these patients, providing timely specialist intervention while allowing patient flow through the hospital system. These units have been set up in medicine with good effect and are now frequently seen within the surgical department [3-4]

The surgical assessment unit (SAU) is where patients with a presumed surgical pathology are reviewed and initial management instigated by the surgical team. The SAU acts as a dedicated, consultant led service, where patients are managed appropriately and junior members of the team are able to access specialist training and teaching in a supportive structured environment without causing a build-up of patients within the accident and emergency department.

The SAU, although not a new concept, forms a new pathway within the hospital service in which emergence general surgical patients are managed [5]. Surgical assessment units allow patient flow from the front door of the accident and emergency unit, through the hospital. This patient flow allows for more patients, not just surgical, to be seen and reviewed within the accident and emergency department, by the appropriate medical or surgical team, as patients are moved from the accident and emergency department to the SAU department. The movement of patients into a dedicated SAU also allows the patient to receive specialist care.Variability in patients' presentation means that management is tailored to both the presenting complaint as well as clinical stability of the patient.Traditionally, reviewing patients who may need semi urgent investigationcan result in the following; admission into a hospital bed with or without surgical operative intervention or discharge with or without outpatient follow up which may take weeks to months to occur.

The United Kingdom (UK) has fewer core beds when compared to comparative nations [6]. Fewer core beds combined with increased pressures for beds, especially during winter, means that telemedicine has started to be considered as a way of reviewing patients where the clinical diagnosis and management allows for outpatient management but there is a risk that earlier intervention maybe needed.

During the COVID 19 pandemic, telemedicine was utilised to a greater extent to manage patients and with the demand for access to healthcare greater than the resources available, it may mean that appointments for the stable, well patient could compromise or even delay the assessment and management of the more unwell patient [7-8].

The use of face-to-face outpatient clinics does allow for the follow up and review of patients. However, there is a burden on patients both financially, associated with travel and parking costs, as well as the psychological in the form of thestress of waiting for a routine appointment to be generated [9]. Telephone follow up could prove to be a potential way to battle rising costs while maintaining a high level of patient care.

The use of telephone follow up has had some success for general surgical conditions such as post hernia repairs, appendectomies and cholecystectomies with good outcomes and little negative impact to patient care [10-11]. This use of telephone follow -up for patients post operatively can be extended to those patients who need imaging and follow for their condition but do criteria admission. up not meet the for

We carried out a quality improvement project within a district general hospital in the National Health Service (NHS) in the United Kingdom (U.K) to assess and improve the use of telephone virtual clinics in reviewing and managing patients who presented with conditions which needed further investigation but not hospital admission.

Material And Methods:-

A single centre, prospective study was designed and carried out to assess the virtual clinic system that was already in place within a general surgical department in a district general hospital in the NHS with view to improve the service to provide better patient care whilst utilising the limited resources available in an already strained national health service.

Primary and secondary parameters were decided upon. The primary parameters were those that directly showcase the service to allow improvement. The secondary parameters were designed to see what types of patients were seen in the virtual clinic and outcomes that were a result of the virtual clinic. The table below shows the parameters that were used for data collection;

Primary Parameters	Secondary Parameters							
Date of admission of patient onto the system	Did patient have a surgical pathology							
Date of discharge of patient from the system	Was the patient symptomatic at discharge from virtual							
l ype of radiological scan requested	Was a formal diagnosis made following virtual clinic							

	review
Date of radiological scan requested	Was there a referral to another speciality / MDT
Date radiology scan was preformed	Was the patient listed for elective surgery following
	virtual clinic review
Date of report of radiological scan	
Date letter with outcome of virtual clinic was generated	
Readmission within 30 days of virtual clinic	

 Table 1:- showing primary and secondary parameters used for data collection.

The Plan, Do, Study, Act (PDSA) method used for quality improvement was utilised for this quality improvement project. An assessment of current practice, prior to the incorporation of an electronic virtual clinic, was undertaken over a 4-week period between 23rd December 2020 and 19th January 2021.

A surgical registrar led electronic virtual clinic was established following data collection incorporating the computer systems that were already in place and in use for outpatient clinic reviews. The virtual clinic was designed to allow patients to receive radiology intervention in the form of imaging such as ultrasound scans, computerised tomography (CT/CAT) scans and magnetic resonance imaging (MRI) scans within 72 hours of initial presentation and follow up, which included the results of scans and plans for any follow up, within 7 days of initial presentation to the service.

Following the incorporation of a surgical registrar led, electronic virtual clinic, practise was reassessed using the established primary and secondary parameters for the assessment of baseline clinical practise.

Access to virtual clinic and outcome of the clinic

The virtual clinic inclusion criteria isany ambulatory patient who requires a "semi-urgent" investigation but does not require admission. The definition of "semi – urgent" in this context is a scan within 72hours of presentation. Haemodynamic stability is essential in patients who go via the surgical virtual clinic pathway as the patients are deemed suitable to be managed at home as opposed to admission within hospital. The main areas patients were referred from were either the surgical assessment unit or the accident and emergency unit.Figure 1 shows the virtual clinic pathway within the general surgical department.



Figure 1:- Shows the patient journey through the virtual clinic system.

* Patients can be referred to the surgical team through various channels including general practise, urgent care and accident and emergency.

PDSA Cycle 1

We used the aforementioned parameters to assess the virtual clinic within SAU. Data collection occurred over a 4-week period between 23rd December 2020 and 19th January 2021. Those patients whopresented under the trauma and orthopaedic team were excluded from the data collection since these patients already had an established and verified pathway in place. Any patient who required admission following a consultant review on the post take ward round were excluded from the data collection, with the exception of those who represented due to ongoing symptoms and subsequently required admission after they had been deemed suitable for the virtual clinic pathway. These patients were included in the data collection as they were deemed as failed discharges.

Development of the virtual clinic list

Following assessment of current practise, it was noted that a list of patientswho requiredfuture telephone review was generated via individuals (doctors and nursing staff) writing down the patients details and requested scans in a book that was left on the surgical assessment ward. The limitations of this system was that only one person could use the book at a time, the system relied on legibility, handwritten entries increased potential for error in transcribing and the book could be misplaced on the ward which would lead to a clinical governance issue in the form of patient safety and patient confidentiality.

The blue book system was replaced by an electronic list of patients being generated. Microsoft ExcelTM was used to generate a virtual list of patients who needed further review, as shown in figure 2.

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Figure 2:- Shows the Microsoft ExcelTM document created so that the emergency on callteam can add details of the patient seen in the SAU and who have been deemed suitable for the virtual clinic pathway from which a virtual clinic list is to be generated.

The Microsoft Excel TM document was designed so that it could be accessed from any trust hospital computer, allowing the list to be updated both in the accident and emergency department as well as the SAU. As the documents could only be accessed by a trust hospital, it afforded some security in regards to patient data confidentiality. A limitation to the use of Microsoft Excel TM to generate a document was that the document was only able to be edited one at a time, this was due to the program design.

The Microsoft ExcelTM list generated was for a 24-houron call period, from 0800 to 0800 GMT the following day. At 0900 GMT everyday, the surgical ward secretary uses the list generated by the surgical on call team over the previous 24hour period to generate a virtual clinic list for use by the surgical registrars. The virtual list generates a time slot for each patient and there is a section to record the outcome for costing of the service. The consultant that the patients originally were admitted under, when they first presented to the surgical team, is the same consultant that is shown on the system, this allows continuity of care and allows the registrar and patients to have a named person they can contact for further support if required. Figure 3 shows how the generated clinic list would be seen by the registrar at the start of each clinic session.

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Figure 3:- shows a generated patient list that would be used in clinic using the dragon system.

Intervention

The results generated when assessing baseline practise prior to the incorporation of an electronic virtual clinic was presented to the general surgical department to highlight both the benefits of a virtual clinic and areas where practise improved with the aim improving patient flow can be further to and care. A virtual electronic clinic was created using the "Dragon SystemTM" and "Care flow TM", both of which were already in place for the use of outpatient clinics. The method by which this virtual clinic list was generated is described above.

The virtual electronic clinic that was developed was then presented to the surgical ward team, both the nursing team and doctors. Posters were also generated and displayed around the SAU, especially the computer room where doctors and nursing staff would carry out admin roles and request scans, to showcase the newvirtual clinic system along with a step-by-step guide on how to use the system.

PDSA Cycle 2

Practise was reassessed using the aforementioned parameters for initial data collection. Data was collected over a 4week period during August 2021 with 112 patients noted to have accessed the virtual clinic. Those patients admitted or reviewed under the trauma and orthopaedic team were excluded from data collection due to a verified pathway already being in place for these patients. Once again, those patients who required admission following consultant review on the post take ward round were excluded from the data collection except those who were discharged on the virtual clinic pathway but then represented and were admitted as these patients were treated as failed discharges.

Data collection was carried out using the electronic patient system that was in use at the time of the quality improvement project over a period of 4 weeks.

Results:-

A total of 190 virtual clinic patients were audited over the two PDSA cycles -77 in the initial review of the service and 112 patients following incorporation of the surgical registrar led virtual clinic. Throughout the period of study, 77% of patients had scans within 72 hours of initial presentation with 85% of scans reported on the same day.

Diagnoses following radiology scans and virtual follow up were as follows: No-diagnosis (40%), Surgical (40%), Urological (8%), Gynaecological (3%), Gastroenterological (1%) and Unknown (7%).

At 8 months follow-up, a total of 17 (9%) patients were readmitted, with 14 presenting with surgical conditions, 2 with gynaecological and only 1 with urological related conditions. These occurred within a median of 31 days after VC scan (range 0-263). The median length of stay for these admissions were 2.5 days (range 1-12).

8 (4%) and 9 (5%) patients were listed for emergency or elective procedures respectively following virtual clinic appointment and review. There was no morbidity associated with these re-attendances with the exception of one patient who had a thermal injury to the duodenum during acute laparoscopic cholecystectomy (discharged day 1 post-surgery).

Demographics using the service

The virtual clinic is designed for patient who are ambulatory and are deemed to have a surgical pathology in which "semi urgent" investigations are needed but not necessary admission. This allows the service to be suitable for a wide range of individuals. Data collected showed that the range of patients in whom virtual clinic was deemed appropriate was varied with the average age of patient being 43 years old with a median age of 42 years old. There was a slight gender predisposition with 54% of patients being female and 46% of patients being male although this was not deemed to be significant.

Surgical pathologies

As none ambulatory patients are excluded from being suitable for the virtual clinic pathway, patients that were noted to access the service were those with conditions that could be managed at home or in the community asthese patients were able go home without the need of social or rehab support. Patients were required to be haemodynamically stable to be deemed suitable for the virtual clinic and so those who were hypotensive, tachycardic, pyrexial or any features of sepsis were excluded from being suitable for the virtual clinic.

Types of radiological imaging requested through the virtual clinic

Baseline assessment of the service showed that ultrasound abdomen scans were the most utilised scans for patients who were seen via the virtual clinic pathway with 41% of requested imaging being for ultra sound abdomens. The second most common scan requested was computerized tomography of the abdomen pelvis with contrast with 20% of scans being requested for CT abdomen pelvis with contrast. Other scans requested included; magnetic resonance imaging of the abdomen and pelvis, magnetic resonance cholangiopancreatography, ultrasound scan of the groin and scrotum and CT pancreas, renal and none contrast CT scan of the kidney, ureter and bladder. Figure 4 below shows the spread of imaging preformed during the 4-week period during collection of baseline measurements.



Figure 4:- shows the spread of requested imaging during baseline measurements.

Following the incorporation of an electronic virtual clinic list and development of the virtual clinic service which was led by the general surgical registrar, the number of patients seen in the virtual clinic over a 4-week period increased by 45% from 77 patients to 112 patients. The spread of requested radiology imaging remained relatively constant with ultrasound abdomens remaining the predominate imaging requested.

The trend of ultrasound scans being the most requested service followed by computer tomography of the abdomen and pelvis with contrast being the second most requested scan was still true following development of the service.

53% of all scans were ultrasound scans, 36% of all scans were CT scans, including none contrast CT scans and 4% of scans were MRI scans. The number of MRI scans were reduced when compared to baseline assessment. This reduction was due to data showing that MRI scans in any form took longer to preform and have a radiologist report generated for. This meant that patients were having to wait for their results and any follow up. As a result of this delay, a separate request system was set up for MRI scans so that there was a clear pathway and patients were able to get a realistic view on how long their follow up would take and what to expect. It is hoped that this will improve communication with the patient and thus improve the patients journey however further work will need to be carried out in order to fully assess this to allow a patient centred approach to care to be fully established.

Figure 5 below shows the spread of imaging requests after the development of the virtual clinic service.



Figure 5:- Shows the spread of requested imaging following optimisation of the virtual clinic.

The results of the quality improvement project showed that there is scope for virtual clinics to provide a service in which ambulatory patients in whom semi -urgent investigations are needed are managed with success in the form of the patient receiving their scan while avoiding admission.

Discussion:-

The cost of attending the accident and emergency department varies depending on whether the department is a major consultant led department or an urgent care centre walk in. The average cost for an individual who attends a walk-in

and received basic investigations and treatment was $\pounds 77$ in 2021/22 and up to $\pounds 359$ for an individual who presents to the accident and emergency department needing more complex investigation and treatment [12].

With an increasing number of patients presenting to healthcare, it means that unnecessary appointments for well patients negatively impacts healthcare for all via taking away or potentially delaying access to investigation and reviews for those patients who have more serious conditions [13].

The Association of Surgeons of Great Britain and Ireland (ASGBI) have defined ambulatory care as "a personal health care consultation, treatment, or intervention using advanced medical technology or procedures delivered on a outpatient basis". The conditions that the ASGBI have deemed suitable for emergency service ambulatory care pathway includes right upper quadrant pain thought to be secondary to biliary colic or acute cholecystitis, none specific abdominal pain if the patient is stable and mild acute diverticulitis [9]

The SAU provides a consultant led dedicated service for surgical patients to be seen, assessed and managed in a timely fashion, away from the accident and emergency department. The driving force for this quality improvement project was to enhance the SAU and the surgical service provided at the district hospital to make it more accessible while providing timely investigations and the results of these investigations to patients. The overall aim of this was to improve patient care and journey by either providing reassurance or further treatment decisions to be made in a timelier fashion.

With 77% of patients seen in the surgical assessment clinic over the assessment period receiving their scan within 72 hours and 85% of these scans having been reported within 24 hours, the SAU, combined with the virtual clinic, allowed over 124 patients (N=112) to be managed in the community but receive their scans and the results of these scans within 5 days of initial presentation to the hospital. This data not only shows the efficiency of the service, the virtual clinic aspect allows for financial savings to both the hospital(in the form of admission avoidance) and to the patients (through avoidance of potential financial losses acquired through parking charges, travel charges or loss of earnings).

Readmission is defined by the patient having to be admitted under the general surgical team, with the same pathology, within 30 days following discharge from the service and although the reason for readmission can be multi factorial, is deemed an indicator of poor patient outcomes[14]. The data showed that 9% of patients reviewed were admitted at the 8 month follow up period with the median time for readmission being 31 days following discharge from the surgical assessment unit. As 31 days post discharge fell outside the definition for "readmission" and it was not be deemed as a failed discharge and shows success of the service with 0% of patients who accessed the virtual clinic pathway being deemed a failed discharge suggesting that the virtual clinic provided a good level of care for patients.

The surgical virtual clinic was run by a designated surgical registrar, separate from the emergency admissions team but the room used for the clinic, the telephone and computer system as well as the nursing staff were all part of the acute emergency team resource pool. There have been studies in other fields such as oncology and colorectal cancer that shows a nurse led service, with the support of a clinician, has shown to provide good patient outcomes and this maybe an area for development in the future [13]. The use of nurse led services may allow for redeployment of the surgical registrars into other areas where their specialist skills and experience may be better served.

The virtual clinic design relied on a telemedicine service to be delivered successfully. With advances in technology and the availability of these technologies, a text-based system, smart phone application or email or virtual face to face maybe an area where this service develops to help provide a face-to-face clinic environment with the gains of a virtual clinic. As technology develops and advancements are made in communication, it becomes vital that medicine and patient interactions keep pace with these changes. In the authors opinion, this is an area for potential development to improve patient care.

The virtual clinic that was set up did not require any further staff members or equipment and suggested that admissions can be avoided by the use of virtual clinics however a formal cost / benefit analysis was not performed. This is an area for further research as the main aim of this quality improvement project was to enhance an existing service in order provide safe and effective care to general surgical patients while assessing the feasibility of a virtual clinic.

Limitation to the service was the variability of experience of the surgical registrar who was in charge of the virtual clinic. Verbal unofficial feedback from surgical registrars suggested that the more junior surgical registrars(1st or 2nd year of training as a surgical registrar) werenot as confident with a virtual telephone clinic when compared to the more experienced surgical registrar. Further work needs to be done in order to quantify this data to allow the service to develop in order to manage this.

Another limitation to the data was the duration of the virtual clinic telephone conversations and whether the time taken for virtual clinic follow up was improved compared to a face-to-face clinic follow up. This data was not collected during the data collection period and so there is no objective evidence to assess whether telephone clinics are more efficient in terms of time-per-patient. Further work is planned to assess this area.

The system of a telephone virtual clinic has the potential to help with managing costs, both emotional and financial, associated with outpatient face to face clinic system. Telephone virtual clinic follow up is a way in which medicine can keep with up the changing needs of patients and the technologies available to all and appears to have a positive impact on patient care.

Conclusion:-

Patients with a surgical pathology that warrant semi-urgent investigation but do not need admission benefit from the use of a virtual telephone clinic follow up system. These patients can be safely discharged home from the SAU with the reassurance that they will have their investigations in a timely manner and if they were to deteriorate, they have the option to return to the ward for further review.

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