# **Online Medical Consultation: A review of literature and practice**

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# Abstract

**Background**: While the internet has long been a source of medical information, it has only recently been used for online private patient-doctor consultations. Online Medical Consultation (OMC) is now offered by many providers internationally with diverse models and features. **Method**: This study reports a review of the literature on OMCs and an empirical analysis of 28 existing OMC web sites to explore their major themes, modalities, costs, and geographical coverage. These features have been studied for a better understanding of the promise on which these services operate.

**Results**: Regardless of the different labels given to OMC, academic works have reported several advantages and raised multiple concerns regarding particular OMC practices. OMC is a growing phenomenon featuring several interaction modalities, serving various medical consultation purposes, and accessible to consumers throughout the world. The contribution of this work is to present the current status and synthesize features of available OMC services.

Keywords: Telemedicine, Remote Consultation.

# 1 Introduction

Online Medical Consultation (OMC) is the term used in this paper to refer to internet-based remote patient-doctor (consumer-provider) medical consultations. OMC can be regarded as part of telemedicine where the term "Remote Consultation" refers to "consultation via remote telecommunications, generally for the purpose of diagnosis or treatment" (NLM, 2014). However, this paper distinguishes OMC from remote consultations in three main aspects. First, the definition of OMC excludes non-internet-based consultations like telephone-only or radio-based consultations. Second, OMC carries a paradigm shift in the way patients seek medical consultation where they can independently "shop around" for medical consultation the same way they do for online services. Third, OMC is about direct patient-doctor consultations, therefore it will not include doctor-doctor (provider-provider) consultations or consultations for health education and other purposes. OMC as a concept goes beyond the common telemedicine practices which are usually limited to specific medical categories for patients within specific geographical/geopolitical regions. With OMC, the service is usually open to patients with a wide range of medical needs coming from different regions or countries. Patients may choose or be assigned to any doctor/ care provider who is available online. They are not restricted to a specific provider either by previous knowledge or by geographical closeness.

The aim of the research reported in this paper is to explore OMC practices on the global level. It examines features and themes evident in the literature and in a range of currently operating OMC services.

# 2 Method

# 2.1 Literature review

Databases including MEDLINE and Inspec were searched for relevant publications mainly within the past five years. Multiple search terms were used, combining "online consultation" with "health or medical", using the MeSH term "remote consultation", or using "e-visit", "econsultation", and "video consultation".

## 2.2 Review of web sites

A convenience sample of current OMC web sites was derived from sites that appeared among Google's first one hundred results when searching for "online health/medical consultation" or "online doctor". These sites were examined against our OMC definition to eliminate web sites that did not match with the inclusion criteria such as health information sites, health advertising, generic wellbeing advice, automated symptom checkers, telephone-only consultations, or sites with no private channel for communicating information. This left 28 web sites which were examined more closely to determine the modality of the consultation, the intended purpose of the consultation, the cost, the medical specialty, the geographical coverage, web site establishment date and the geographic location of the service provider. Data were sourced directly from the web sites, requested from the providers by email or found in public media reports.

# **3** Findings from literature review

We did not find any published research that evaluated multiple OMC sites. The majority of papers provided an evaluation of remote consultation use for a particular medical practice but not for a large group. They mainly discussed medical implications, communication styles, and information exchange. Some eVisit studies evaluated consumers' demographics, disease categories, response times, and some impact and financial aspects (Padman et al., 2009, Mehrotra et al., 2013, Adamson and Bachman, 2010, Albert et al., 2011).

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Diverse terminology is used to label various medical services delivered through internet and there are no universally accepted definitions of these terms (Bailey, 2011). Consultations over internet have many names: teleconsultation (Verhoeven et al., 2010, Deldar et al., 2011), e-Visit (Padman et al., 2009, Mehrotra et al., 2013, Handler, July 2013, Adamson and Bachman, 2010, Albert et al., 2011), e-Consultation (Liddy et al., 2013, Drop et al., 2012), video consultation (Jiwa and Meng, 2013, Joseph et al., 2012, Smith et al., 2012), or online medical consultation (Brockes et al., 2012, Bailey, 2011, Braverman and Samsonov, 2011, Lu et al., 2011, Medaglia and Andersen, 2010).

In the US, the term eVisit is more common. However, the term is associated in many references with the asynchronous form of OMC (Gidwani et al., Mehrotra et al., 2013). In Australia, the common term is "video consultation", apparently referring to the synchronous form of OMC. To have a balanced and clear reference for both forms, the term online medical consultation (OMC) appears to be most appropriate.

OMC carries several opportunities for research and practice. OMC has attracted providers' and consumers' attention since the beginning of this century. In 2006, the editor of the Health Management Technology magazine reported that healthcare consumers have always wanted to be able to communicate with doctors - electronically the way they now do with the rest of the world, especially for non-urgent matters not requiring a face-to-face office visit (Blair, 2006). The same point iss affirmed by recent research (Dudas & Crocetti, 2013). OMC is expected to attract demand from patients who live in remote areas, from aged and disabled patients, and from patients with chronic diseases. It may also be favoured by young and internet-savvy people, and employees with inflexible conditions. Academic working reviews of telemedicine/OMC/eVisits have cited several advantages for patients such as increased convenience and accessibility to health services, reduced travel and waiting time to see a doctor, and being a more cost-effective delivery mode (Moffatt and Eley, 2011, Albert et al., 2011, ATA, 2012, Moffatt et al., 2010).

With OMC, patients don't have to leave their homes or places of work, sit in traffic then sit in a room with other patients, perhaps catch or cause an infection meantime, and then return to where they came from. A baby's mother may not need to go with her child to a clinic for diagnosis of a simple condition such as diaper rash that doctors can accurately recognise from some images. Patients with chronic diseases may benefit from OMC to perform their regular routine checks and get test results with no need to go to a clinic unless requested.

The Mayo Clinic eVisit pilot program reported in 2010 that their online consultation service was used for patients aged from 4 days (for diaper rash) to 86 years (for insomnia and hypertension) (Adamson and Bachman, 2010). OMC is a promising innovation. Several US publications have reported that eVisits were found to be feasible with high patient satisfaction levels (Mettner, 2009, Albert et al., 2011, Adamson and Bachman, 2010). Internet-based video consultations have been practiced successfully in Australia in fields such as psychiatry,

emergency care, and paediatrics (Moffatt et al., 2010, Richardson et al., 2009).

Consumers have been reported to be in favour of OMC services. An evaluation study by researchers from Pittsburgh University (USA) reported that the eVisit services offered benefits to patients in terms of access, speed and convenience, without increasing the risk of inappropriate or incomplete care (Albert et al., 2011). Over 90% of the eVisit patients indicated that their health problem was addressed fully during the eVisits, concluding that it is an appropriate alternative to office visits. The same study suggests that further investigation is required, to compare eVisit outcomes with office visits for similar medical conditions, and to investigate providers' perspectives.

On the other hand, concerns are being raised regarding safety and quality of OMC practices. A study in Australia showed that only 29% of the study population (young people) were willing to participate in a video consultation regarding their sexual health issues, while 63% gave higher preference to telephone consultation (Garrett et al., 2011). Another review showed a slow uptake of telepsychiatry in Australia despite its reported successes internationally (Smith et al., 2012). A recent media release by the royal Australian college of general practitioners (RACGP) stated that the service delivery model of certain OMC providers adds more difficulty for doctors, who may have to diagnose the patient without fully understanding the medical and social context , or being able to do a physical examination (RACGP, 2012).

Additionally, the economic advantages of OMC could be questioned. The cost of the healthcare system in Denmark was found to be escalating with the use of online GP consultations (Medaglia and Andersen, 2010). Another study in the UK reported that there is lack of evidence regarding cost-effectiveness, quality, efficacy and patient satisfaction in teledental applications (Patel and Antonarakis, 2013).

These conflicting reports indicate a lack of clarity as to the efficacy of OMC despite the apparent potential and reported benefits. OMC can be viewed as a disruptive technology to the traditional model of medical consultation. OMC may bring remarkable changes to the processes of doctor selection, patient examination, and treatment options.

#### 4 Findings from web site analysis

### 4.1 OMC growth

OMC services have grown at an average rate of 150% every five years since the year 2000 (Figure 1).



Figure 1: Date of establishment of 28 OMC sites

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### 4.2 Modality

Each OMC site utilized several modalities (Table 1). Telephone was used in conjunction with other internetbased modalities in all the services.

Private portal	Video con- ference	Tele- phone	E- mail	Smart phone	Public forum
19	17	10	9	7	2
(68%)	(61%)	(36%)	(32%)	(25%)	(7%)

Table 1: Modalities used by 28 OMC sites

#### 4.3 **Purpose of consultation**

The research sought to confirm what each OMC site offers. Is it for wellbeing advice and information only? Does it include a diagnosis or clinical opinion? Can it be used to obtain prescription medicines? Table 2 shows the findings.

Diagnosis	Wellbeing advice	Prescription	
28 (100%)	28 (100%)	19 (68%)	

Table 2: Consultation purposes of 28 OMC sites

#### 4.4 Medical Specialty

Information obtained from almost all OMC sites (96%) showed no restriction to a specific medical specialty. They appear to have flexibility to expand services and ability to recruit specialist consultants in all fields. Some sites claim to have hundreds of participating consultants from multiple countries.

## 4.5 Cost

Regardless of some promotional offers, almost all OMC sites (93%) charge fees for their services. In most cases, consumers have to pay for the service directly at the site, but a few providers offer the possibility of private insurance or government reimbursement. The cost of an OMC service ranges from a few dollars (Evaidya, India) to more than \$700 (Cleveland e-consult service for specialized second opinion). Payment schemes vary, such as paying per consultation or as monthly plans. The average cost for a single OMC service in the US is around \$33 and ranges from \$18 to \$50 (excluding the cost of Cleveland e-consult). Among the 28 OMC providers, two are free (Partners HealthCare, Medanta) and serve as second opinion services (one is e-mail based and the other supports video).

### 4.6 Geographical location and coverage

Most OMC sites (79%) offer their services worldwide and are not bound by the country where their operating business is legally based. The remaining 21% are limited to the country of operation due to their dependence on local insurance or government rebates, for example, two US-based companies, and three Australian providers. Figure 2 shows countries where operations are based.

### 5 Discussion and conclusion

OMC is a growing phenomenon featuring several interaction modalities, serving various medical consultation purposes, and accessible to millions across the world. Online medical consultations are readily accessible and very topical.



Figure 2: Country operation base of 28 OMC sites

A simple internet search of 'online doctor', or 'online medical consultation', returns hundreds of links for sites ranging from free ask-the-doctor sites to highly prestigious sites with sophisticated diagnostic tools and multi-interactive options.

OMC may be unevenly available worldwide. The countries of operation for OMC sites may need further analysis to correlate with local factors. Factors may include scale of internet services, recognition by professional bodies, and availability of reimbursement systems, not to mention cultural and linguistic factors that may have significant impact on OMC raise.

Future research is in progress to fully describe OMC models of service and models of care, and to investigate OMC services adoption and quality from both providers' and consumers' perspectives. Since OMC providers and consumers are more autonomous than conventional telemedicine, there is a need for their quality to be evaluated using innovative criteria that are adapted to their unique nature. Professional, legal, and financial systems will need to be modified in order to create the proper environment for OMC growth, and at the same time to ensure good health outcomes with patient and clinician satisfaction. The challenges and opportunities for health service provider organisations responding to the rise of OMC services also merit further investigation. Our work casts light on a new avenue for consumer choice, an open market space for health care providers, and a field of research with many unanswered questions.

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