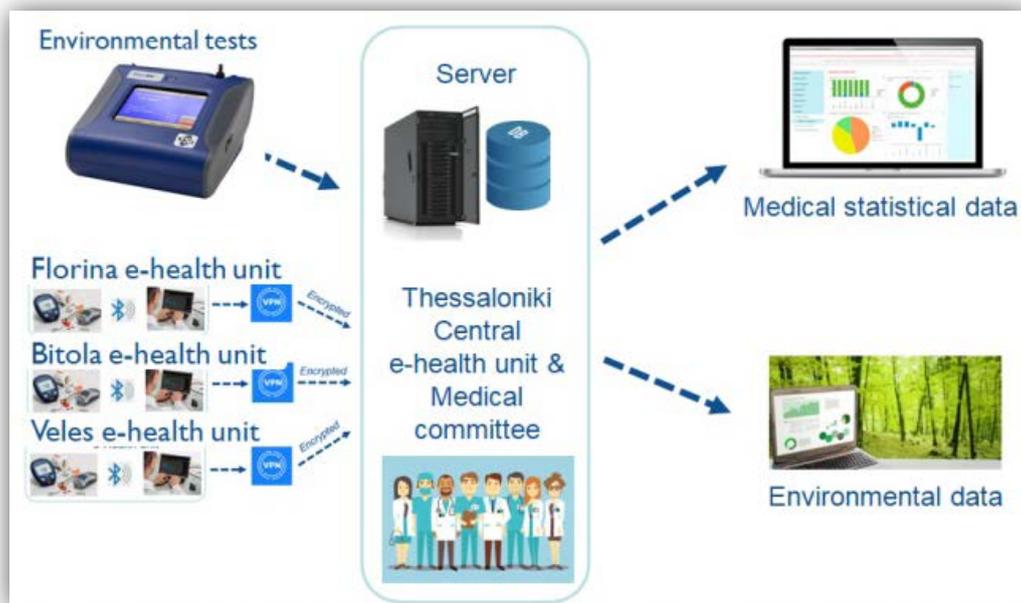


User Requirements of e-Health Units



WP3 / D3.1.1

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INTRODUCTION

This report provides basic guidelines for designing and setting up the COMETECH e-health units. It provides practical information and advice on the main elements to consider in designing the unit that will be used for remote clinical consultations of the COMETECH project. General elements include: security, privacy, confidentiality, and connectivity. Additionally, certain elements should be considered when choosing and designing a room, such as:

- Location.
- Space/ size.
- Layout.
- Acoustics.
- Lighting.
- Interior surfaces.
- Site identification.
- Equipment.
- Security.

The main objective is to create a functional, yet comfortable, space for both the clinician and patient for both the development of the e-health units.

PROJECT OVERVIEW

The Interreg IPA CBC Programme "Greece - The former Yugoslav Republic of Macedonia 2014-2020" is a cross-border cooperation Programme co-financed by the European Union under the Instrument for Pre-Accession Assistance (IPA II). The strategy statement of the Programme is "to enhance territorial cohesion by improving living standards and employment opportunities holding respect to the environment and by using the natural resources for upgrading of the tourism product". The total budget of the Programme for the period 2014-2020 is 45,470,066.00 €.

COMETECH is implemented by a partnership consisted of five partners from both participating countries:

Table 1. COMETECH Partners

Pr. Nr.	Partnertitle	Country
LB (PP1)	International Hellenic University	Greece
PP2	Florina Prefectural General Hospital	Greece
PP3	Medical Association of Thessaloniki	Greece
PP4	Clinical Hospital Bitola	Republic of North Macedonia
PP5	General Hospital Veles	Republic of North Macedonia

COMETECH project aims to address the problem of inadequate access to the health system services to people who live in isolated communities at Greece- Republic of North Macedonia cross-border areas. The project will establish four (4) e-health units -2 in each country- at isolated and deprived communities collaborated each other, aiming at introducing "Continuity of Care" in the border region between

Republic of North Macedonia and Greece. It anticipates contributing to the improvement of health services of both countries in a commonly shared region that has been economically neglected to a substantial degree.

The establishment of the e-health units will allow affordable access to medical services within Greece- Republic of North Macedonia cross-border area. These units (equipped by state-of-the-art medical devices, supported by an advanced software application and medical staff) will record data of local people, inform them about environmental and other risk factors, and offer valuable and high quality medical care services.

The records of the citizens using the COMETECH services will be safely and easily accessible by their physicians. The involved public bodies will be encouraged to use COMETECH services as a tool for introducing high quality continuity of health care in their respective regions.

COMETECH objectives

COMETECH specific objectives are the following:

- To support a collaboration between research teams from Republic of North Macedonia and Greece of scientists from different scientific fields (such as doctors, biologists, etc.) and closer cooperation among the two national health care systems so as to develop a common strategy for prevention, early diagnosis and treatment of Obesity, DM and Cardio Vascular Disease (CVD).
- To raise awareness of the local and national authorities regarding the above health issues.
- To inform the regional population on the prevention, diagnosis, and treatment of DM, Obesity and CVD.
- To identify the environmental and other risk factors that are involved in the development of DM, Obesity and CVD in the population that will participate in the project.

- To facilitate access for doctors on both sides of the border to their patients' data through telehealth.
- To develop four e-health units equipped by hi-technology medical devices and supported by an advanced software application for ensuring "Continuity of Care" through telehealth.
- To support the life-long education of the COMETECH involved population and medical practitioners by utilizing their telehealth interaction with experts as the means for training.

COMETECH expected results

Patients with type 2 DM are usually asymptomatic and the diagnosis of diabetes delays until serious complications develop. Therefore, the assessment of DM, Obesity and Cardiovascular risk factors and the providing of up to date information on these diseases will increase the awareness of the population. This will reduce the occurrence of above diseases in the targeted isolated areas.

On the other hand the cost of DM, Obesity and CVD is tremendous. Over the lifetime, DM imposes a substantial economic burden on healthcare systems. It has been calculated that the medical per person costs of treating DM and its complications, during a lifetime, is in average 85,200 Euros. The total annual cost of DM, Obesity and CVD in EU is about 550 billion Euros. Taking this into account, the current research project is of great value not just in terms of medical but also in terms of the high economic benefit for every citizen separately and for the national health system, as a whole. COMETECH project will also promote the cooperation between healthcare authorities.

Total Project budget amounts 1.018.189 EUR, i.e. 321.486,00 EUR for project activities that are to be implemented in the former Yugoslav Republic of Macedonia, while the remaining amount of 696.703 EUR is allocated for the implementation of activities in Greece. The project duration is 24 months.

COMETECH e-Health units architecture

COMETECH will establish four (4) e-health units collaborated each other, aiming at introducing "Continuity of Care" in the border regions. These units (equipped by state-of-the-art medical devices, supported by an advanced software application and medical staff) will record data of local people, inform them about environmental and other risk factors, and offer valuable and high quality medical care services.

The architecture of the e-health units is illustrated below:

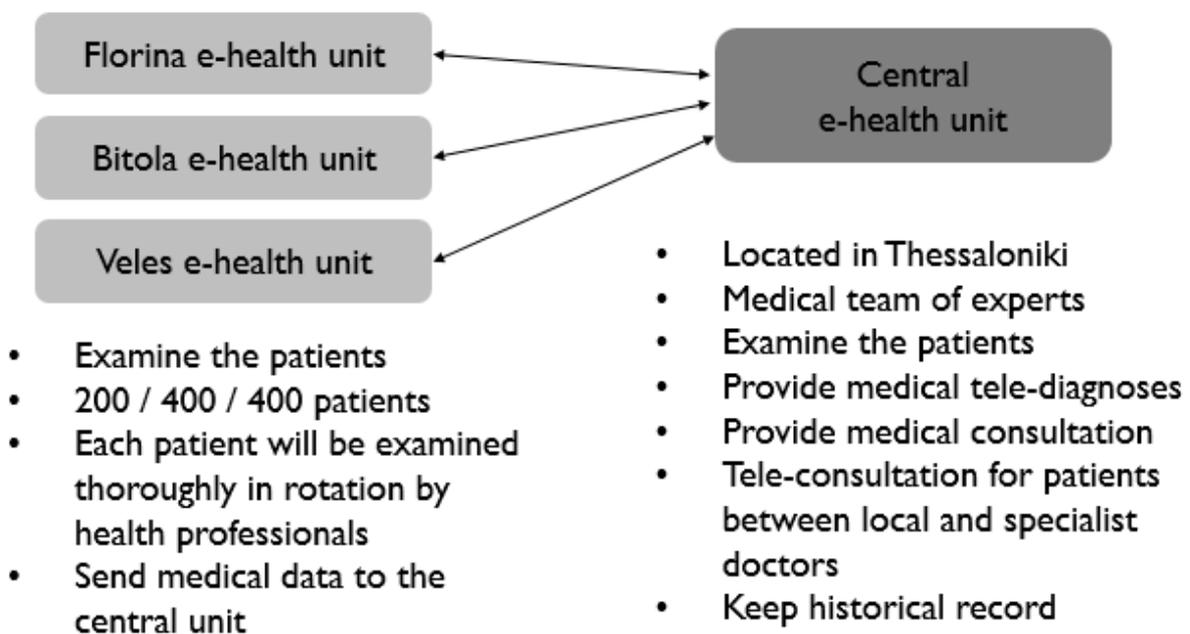


Figure 1. COMETECH architecture

GENERAL REQUIREMENTS

The appropriate location and configuration of space used for an e-health unit can help all participants (doctors, nurses and patients) reduce the barrier posed by the physical distance between them. It is probably easier to establish a trusting relationship if the patient is comfortable and is not straining to see things. E-Health unit, where clinical telehealth services are provided shall meet the requirements that directly relates to the services provided and the patient needs.

Once the various medical devices had been selected, it must be ensured that the room for the e-health unit is set up appropriately. Taking the time to design a comfortable and private workspace can improve telehealth practice efficiency, enhance the virtual patient experience, and create an ergonomic that will support medical services in telehealth paradigm. Where low patient volume makes provision of a dedicated telehealth room impractical, the space also can serve other functions such as a physician's office, exam room or conference room.

Security

The space should have a call-bell system for staff or patients to access assistance quickly. If your space is used for purposes other than telehealth, the telehealth equipment should be locked in secure cabinets. All of the peripherals (slide projector, laptop, stethoscope, etc.), should also be secured in locked cabinets. The door to the space should remain locked when the room is not in use. Key circulation should be well controlled to minimize tampering/damage to the equipment.

Secure storage is required for telehealth spaces where portable equipment and peripheral devices (e.g., digital cameras, task lighting and electrocardiogram devices) are used. Additional guidance for equipment used for telehealth services includes camera placement so that participants in the telehealth communication perceive the exchange as happening eye-to-eye, and provision of temperature controls based on the heat the electronic equipment may generate. Depending on the complexity of equipment used, multiple outlets may be required. Finally, a

reminder is given to select and install telehealth equipment to facilitate cleaning and support infection-prevention practices.

Privacy

The telehealth room shall provide speech and visual privacy with adjacent spaces based on the room's clinical function. Space shall permit arrangement of monitors, screens, or other projections of images or data so they are not visible to causal observers outside the telehealth room.

Confidentiality

It is important to take the issue of privacy into account and to choose a room that ensures patient confidentiality. Only the individuals involved in the consultation should be authorized to see and listen to what takes place in the room. The volume should be high enough to facilitate a conversation between patient and clinician, but not so loud that people outside the room can hear what is being said inside the room. Indeed, cases, such as telehealth consultations, a headset may be used to obtain better sound quality and for confidentiality purposes. To prevent unauthorized individuals from intruding on the consultation, a sign should be placed on the door to indicate that the room is occupied. A door hanger may be useful for this purpose.

Connectivity

The room should be equipped with electrical outlets and an Internet connection. To optimize data transmission and obtain better image and sound quality, the use of a wired rather than wireless Internet connection is recommended. The location of the outlets will be assessed according to the room's design and the peripherals that will be used.

KEY FACTORS

Several factors influence the design of the space used for the e-health unit. In general, the location of the room can be critical, but there are some other factors, which can be considered as equal significant. The wide variety of telehealth solutions have equally diverse infrastructure requirements. However, by synthesizing the existed literature (Facility Guidelines Institute, 2018;Hume and Looney, 2016; PHSA, 2015; Krupinski, 2014& 2009;Turvey et al., 2013; Krupinski, et al.,2008;Otn, 2013; Major, 2005; Collins, 1996),the following critical factors can be identified¹:

- Location.
- Space/ size.
- Layout.
- Acoustics.
- Lighting.
- Interior surfaces.
- Site identification.
- Equipment.

The above factors are described in more details in the following sections:

Location

A location that is convenient for users will encourage their participation and support for telehealth. Some organizations choose to locate a fixed space(s) dedicated for telehealth, while others may have telehealth sharing space with other programs in a multipurpose room. Still others may choose to implement telehealth at the point-of-care, depending on the nature of the clinical service or program. Where renovations to existing infrastructure to accommodate telehealth

¹These can be consider as the minimum design requirements for telemedicine spaces. The minimum telemedicine design requirements strive to produce the same level of care as in-person facilities when it comes to patient experience, quality of care, and privacy.

are not possible, some adjustments will likely be required to accommodate telehealth equipment and to provide for privacy considerations for clinical sessions.

One of the most successful telehealth sites in the Arizona Telehealth Program (ATP) is the Tuba City Regional Health Care Corporation in Tuba City, Arizona. The telehealth room here is located in a walk-in clinic that is centrally located for all patients and clinicians, making it easy to walk there from any office or central check-in desk. There are other medical institutions that have the telehealth equipment located in their only conference room, which is situated away from the main patient visitation areas and examination rooms. Such rooms are not easy to get to for either the clinician or the patient, and are often not available because of meetings being held there. This means that the equipment is not accessible or used very often. Any room identified as a telehealth clinic, needs to be in a suitable location and to be accessible for both the patient and the health-care provider.

Ideally, it should be designated specifically for telehealth so that it will always be available when needed it is important to decide what specialty consultations or services will be provided when determining how the space will be designated for telehealth use. For sites engaging in clinical telehealth, easy access for patients and close proximity to washrooms, change room facilities (to accommodate clients who may have to change into examination gowns), patient reception areas and outpatient registration counters as well as emergency resuscitation equipment are important considerations, as is wheel-chair accessibility. The space should have a call bell system for staff or patients to access assistance quickly. Appropriate signage, indicating the location of the telehealth clinical space for patients, volunteers or even emergency responders, should be considered.

Space/ size

In general, the space and size of the room depends on the type of clinical service being provided, the type of equipment required and the number of people the room will accommodate. The e-health unit room should be large enough to allow for easy movement around the patient without disrupting the consultation. Bigger

is definitely better and a large room is necessary when providing both clinical and educational/research applications. For example, the size of the room affects the camera's field of view, since the distance between the walls determines the proximity of the patient to the camera.

In the COMETECH project the telehealth space is also used for patient exams, there must be enough room for the telehealth equipment, exam table, patient presenter, hand-washing station, and a documentation area. In overall, the types of clinical services being offered can dictate the size of the space as well as its location within the health-care facility, so it is important to let the function help guide the design. Several room treatments should be performed before any telehealth equipment is installed in order to prevent possible problems when using microphones (e.g. echo) and cameras (e.g. glare and reflections) in a clinical setting. Furthermore, if telehealth spaces should be designed with privacy in mind. Patients, monitors, and screens should not be visible from outside the telehealth space.

For the COMETECH project, the size of the space must be large enough to comfortably accommodate the number of users (doctor, nurse and patients) expect while also housing your telehealth system, peripheral devices and furniture. Since it is mainly dedicated to diabetes, it will probably be necessary to perform gait studies and therefore enough space is needed for the patient to take 8-10 steps. Thus, the telehealth room must have about 5m of unimpeded walking space. If the telehealth room is only 3m²4m, then a gait study may need to be done by walking up and down the hall outside the telehealth clinic room. Bluetooth, as well as, long camera and microphone cables help with this, but clearing the hallway of other pedestrian traffic may present a problem.

Some space will likely be multi-purpose and used for patient consultations, team conferences and larger groups attending educational events or administrative meetings. The area should have a ceiling no higher than 3 m. Participants should sit at least 1 to 2 m. from the main teleconferencing camera and monitor so that the remote viewers have a suitable image. Rooms used to accommodate clinical

telehealth should have doors wide enough to admit a stretcher or wheelchair and consideration for enough floor space to allow clients to walk a distance.

Layout

Regarding the layout, typically the various medical devices are situated in front of the participants. In the COMETECH project, doctors, nurses and patients should sit directly in front of the camera so that they do not look like they are looking upwards, downwards or sideways. If extra monitors are attached to any medical device, they should be positioned close enough so that participants look in the direction of the main camera lens. This produces natural images at the far site. A horseshoe arrangement of seats permits a clear view of each participant, although some panning by the camera will be necessary to optimize results. This layout can work very well for small groups such as in the COMETECH project.

The examination table or patient's chair should not be placed in front of a window, as this causes backlighting and degrades image quality. Similarly, the remote clinician should not stand in front of a window. If there are no other options, curtains or opaque shades should be installed to reduce the backlighting effect.

As previously mentioned, it is important to keep in mind the image that will be projected onto the other person's screen. Any visual elements that maybe distracting to the speaker should be removed. Paintings could be added to give the room a more pleasant atmosphere, although it is preferable to place them on walls that will not be visible onscreen, that is, outside the camera's field of view. The wall behind the speaker should be neutral.

Furthermore, the choice of furniture is relevant when outfitting the room, as it can help create a pleasant atmosphere and foster a climate of trust, especially in a telehealth context, in which patients should feel comfortable confiding in the clinician. Although comfortable furniture might seem to be a good choice, the different possibilities and uses for the room should first be considered. For example, an armchair might be appropriate for telehealth health consultations, but might not lend itself as well to "more medical" contexts.

In the case of telehealth health, some recommend that a table be placed in front of patients to help them feel more comfortable and to create a “buffer zone” between the patients and the videoconferencing material. However, others recommend against this, as it prevents the proper interpretation of body language and places an obstacle between the speakers. A table should not be placed in front of the clinician, as it would give the teleconsultation an official and impersonal feel.

The following example for the design of telehealth health rooms takes the previously mentioned elements into account.

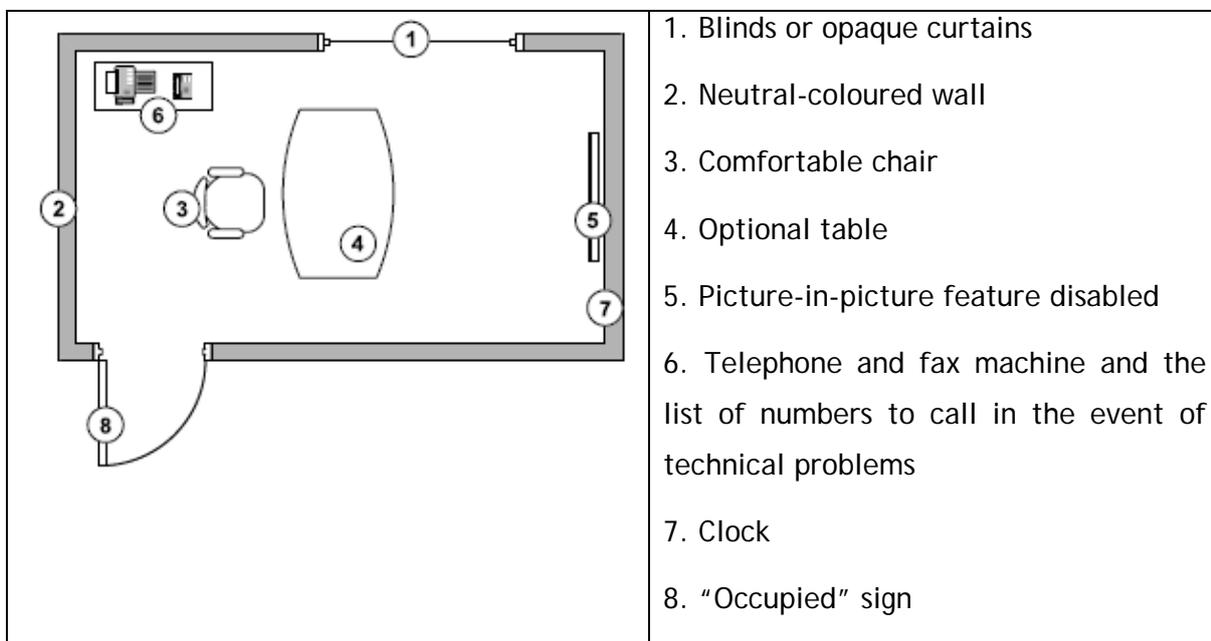


Figure 2. Typical telehealth room layout

Finally, a “troubleshooting” sheet should always be available and clearly displayed in the room, to indicate which actions to take or numbers to call in the event of a glitch or technical problems.

For the COMETECH project, the systematic layout planning (SLP) is followed for the preparation of the e-health units’ layout. SLP is a tool used to arrange a workplace by locating areas with high frequency and logical relationships close to each other (Muther and Hales, 2015). SLP technique applied to optimize the existing layout. The application is expected to make the fastest material flow with the lowest cost and least amount of material handling (Muther, 1973; Jain and Yadav, 2017).

First, the Activity Relationship Diagram of e-health unit is developed, presenting the flow of the patient.

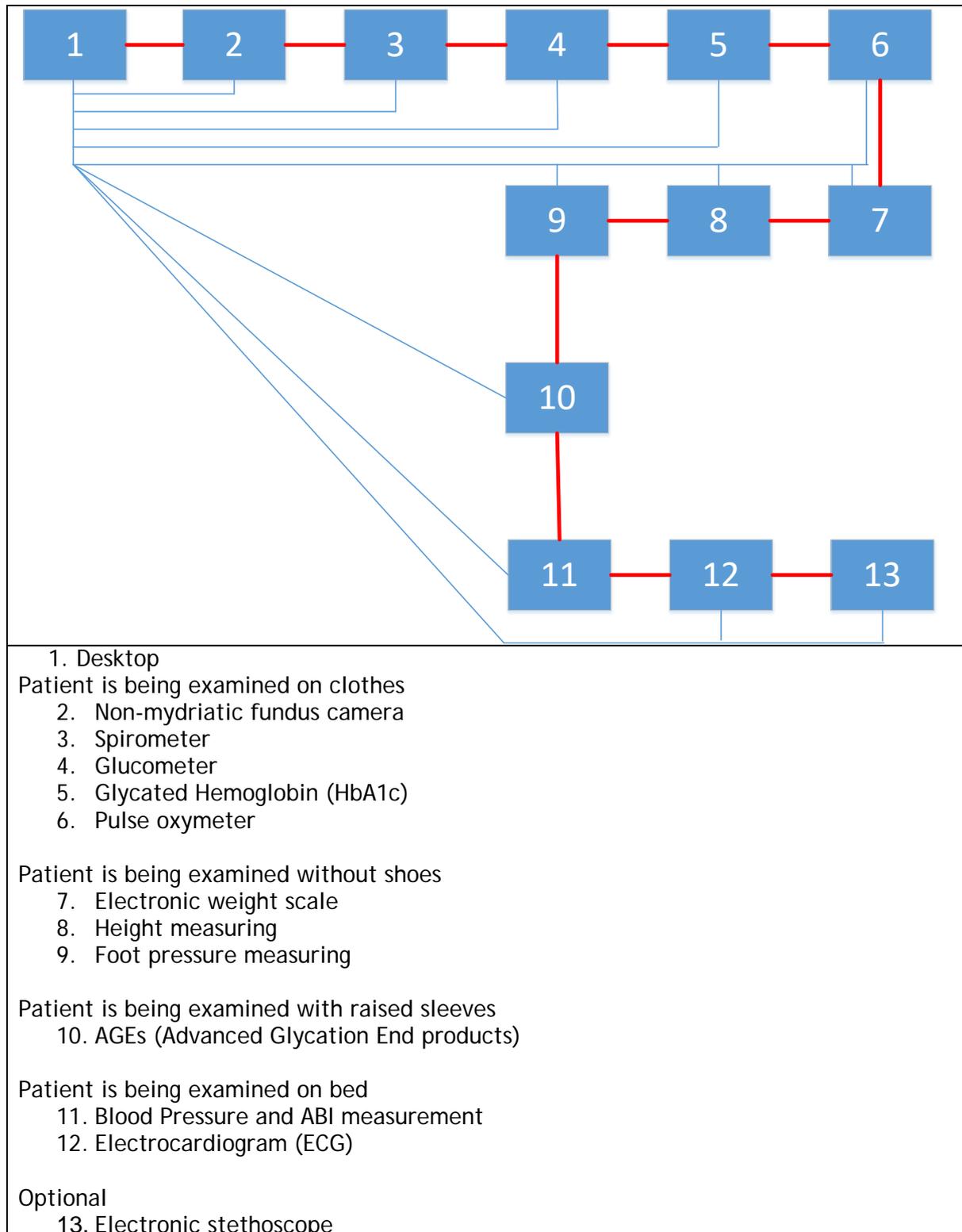


Figure 3. Activity Relationship Diagram of e-health unit

Then the Space requirement for each part table is developed.

Table 2. Space requirement for each part

Devices	Space Area (m ²)
1. Desktop	1
2. Non-mydriotic fundus camera	2,5
3. Spirometer	1
4. Glucometer	1
5. Glycated Hemoglobin (HbA1c)	1
6. Pulse oxymeter	1
7. Electronic weight scale	1
8. Height measuring	1
9. Foot pressure measuring	1
10. AGEs (Advanced Glycation End products)	1
11. Blood Pressure and ABI measurement	6
12. Electrocardiogram (ECG)	6
13. Electronic stethoscope	1
Total area	24.5m²

Finally, the layout of the Systematic Layout Planning is produced (Table 4), based on the following memo.

Table 3. SLP closeness values

Value	Closeness
A	Absolutely necessary
E	Especially important
I	Important
O	Ordinary OK
U	Unimportant
X	Not desirable

Table 4. SLP closeness values

Devices	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Desktop													
2. Camera	A												
3. Spirometer	I	A											
4. Glucometer	I	O	A										
5. HbA1c	I	O	O	A									
6. Pulse oxymeter	I	O	O	O	A								
7. Weight scale	I	O	O	O	O	A							
8. Height measuring	I	O	O	O	O	O	E						
9. Foot pressure	I	O	O	O	O	O	O	E					
10. AGEs	I	O	O	O	O	O	O	O	E				
11. Blood Pressure	I	O	O	O	O	O	O	O	O	A			
12. ECG	I	O	O	O	O	O	O	O	O	O	A		
13. Elect. stethoscope	I	O	O	O	O	O	O	O	O	O	O	A	

Acoustics and sound considerations

In general, a telehealth room must have an acoustic environment that facilitates speech intelligibility and communication. When planning for dedicated telehealth rooms like COMETECH e-health units, they should be located in a quiet area away from loud mechanical equipment, foot traffic, the central utility plant and exterior noise sources. A telehealth room also must be designed for the sound isolation rating appropriate for its clinical function. In designing to achieve this minimum sound transmission class rating, consideration of all portions of the room envelope is recommended, including walls, floor/ceiling assemblies, doors and glazing, as well as, field conditions that may affect the performance of those elements. As well, background noise levels in telehealth bays, cubicles and rooms must be suitable for the clinical functions performed in the space.

The Guidelines for Design and Construction of Hospitals and Outpatient Facilities, 2014 edition, published by the Facility Guidelines Institute, includes acoustics requirements for maximum noise levels, sound absorption coefficients, sound isolation between rooms and speech privacy, all of which must be considered for telehealth. Specifically, e-health units' space should be a quiet area away from open office areas, busy corridors, stairwells, parking lots, waiting rooms/areas, HVAC systems, and toilet rooms are unsuitable etc. Rooms must also consider the sound isolation rating based on the room's clinical function. Too much background noise will result in poor quality sound during your teleconference. The microphones on teleconference systems are sensitive to noise, which can be picked up at the far site. They should be placed in front of the individuals speaking in the videoconference but at least four feet from the unit to prevent audio feedback.

Therefore, space is ideally located in a quiet location away from internal and external noise and sources of vibration, including fans, air conditioners or plumbing. In-room ventilation systems should be quiet. Ideally, overhead paging systems should be excluded from the space. Sound bounces around a room with hard floors and un-textured walls or ceilings bounce, creating a very poor audio environment. While sound-absorbing wall coverings are ideal, an inexpensive and effective solution for reducing noise is to install regular wall insulation above the ceiling tiles. Alternatively, a location removed from high traffic areas to reduce the possibility of a breach of client confidentiality.

In overall, COMETECH e-health unit rooms will maintain the minimum sound absorption coefficient for the room's clinical requirement and support sound isolation in any background noise or maintain it at the lowest levels.

Lighting

Direct frontal lighting must be used in the space and it is recommended to use both direct and indirect lighting to reduce shadows and produce more accurate coloring in the transmitted image. Proper illumination levels ensures proper skin color. Regular fluorescent lights can cause a glare or produce a greenish hue, which is

misleading during clinical telehealth sessions. Glare from lights can also make an image look blurry on the videoconference monitor. Lighting sources should bathe subjects from the front and side, but never from behind.

Lights should never be visible in the range of the camera as this makes it difficult to control image brightness. Position the light so that it shines in the same direction that the cameras are usually pointing to help eliminate this common error with room lighting. For clinical telehealth, many aspects of a physical examination are in fact not color or texture dependent, but require the creative use of shadows to illuminate changes in size, pulsations, or body movement. Accurate color reproduction is important for many clinical telehealth applications, and is especially crucial in dermatological exams. The position of the camera is very important in enabling visual contact between the two people. The cameras should be positioned in a way that allows both individuals to look directly at each other.

Steps must be taken to reduce glare, such as adding blinds to windows. Especially, if the room of the e-health unit has windows, consideration must be taken that there are also window coverings to ensure privacy and good light control (outdoor light can interfere with your video image). Depending on the amount of outdoor light a room receives, window coverings may need to be of black-out quality. When people sit in front of windows, they may only appear as shadows to viewers at the far site. Moreover, windows can also be a source of distraction for far site viewers if they can see outside activity through a window during a videoconference.

In overall, for the COMETECH project, the room of the e-health unit shall provide the ability for direct frontal lighting. Optimal lighting is a diffused light source that does not create shadows and that displays colors accurately. Moreover, since that the camera alone cannot correct lighting problems, good lighting can considerably improve image quality, even with the use of low-quality cameras. Lighting is an important element, since it has a direct impact on the clinician's ability to clearly see a patient through good color reproduction, which can be critical in certain cases of patient assessment, as in dermatology, for example. The light source should be located above the videoconferencing unit and shine diagonally toward

the patient. Finally, direct sunlight on the speakers or cameras should be avoided, as it creates contrast problems.

Interior surfaces

When choosing interior finishes and colors, facilities must choose colors that will render properly in the transmitted image. A flat paint color is recommended for the backdrop wall to reduce glare and reflections. Walls should be painted a medium shade of solid grey-blue for optimal videoconferencing. This color provides the same depth of color as skin and hair, allowing the camera lens to let in just the right amount of light. A solid background makes it easier to concentrate on the image while panning over or zooming in on an image. Matte or flat finish is recommended to minimize reflection within the room. White walls and bright colors such as red and yellow should be avoided as they 'fool' the camera lens, resulting in images that are either overexposed or shadowed.

Site identification

Facility identification must be provided at the telehealth site so that it appears in the transmitted image unless such identification is embedded in the electronic telehealth platform. This signage is sometimes required for reimbursement, but is also helpful for reminding clinicians and patients where the person with whom they are speaking is based when telehealth services are offered between multiple locations. Facility signage should be easily seen, whether on the backdrop wall or if it is embedded in the video platform.

Equipment

In the COMETECH project, the e-health units will be equipped with the following specialized (tele) medical devices: Electronic weight scale, Height measuring, Electronic stethoscope, Electrocardiogram (ECG), Spirometer, Pulse oxymeter, Glucometer, Glycated Hemoglobin (HbA1c), AGEs (Advanced Glycation End

products), Blood Pressure and ABI measurement, Foot pressure measuring, and non-mydiatic fundus camera.

Furthermore, web camera placement is critical. Patients must feel they are receiving the same intimate care as they would if they were there in person. To do this, the cameras of both parties should be placed at eye level. In addition, doors and windows in line with the camera should remain closed or shielded to maintain patient privacy. Telehealth design requires a secure storage option for equipment. Room temperature must be monitored to account for the heat of the electronic devices. Telehealth equipment should follow infection-prevention practices.

The impact of the e-health units includes the room location and size, flooring, lighting, power, data and conduit pathways. Mandatory space requirements include power connection, network connectivity, and signage. All other elements are guidelines based upon previous experience and industry recommendations. Nevertheless, the impact extends beyond a single room, requiring an assessment of network infrastructure, building services, power distribution and more. Even Web-based solutions using existing computers have potential impacts on a facility's design and physical infrastructure.

It is worth mentioned that each COMETECH e-health unit requires grounded standard electrical outlets. The telehealth system should be positioned based upon lighting and room layout constraints, with outlets installed in an easily accessible location no more than four feet from the telehealth system. Signage is also mandatory to the provision of telehealth and ensure that it is visible to each patient who participates in a telehealth event. It is good practice and important videoconference etiquette for all sites to be identified during a telehealth event. Tabletop signs are best seen when they are on the table in front of the participants. Wall signs are best seen in view of the main camera when they are behind the participants. Additional suggestions for signage include one on the outside of the door to identify the telehealth space and a "Telehealth session in progress" sign to hang on your door during an event. A clock can also be considered as mandatory. Telehealth events should begin and end on time. A clock mounted on the wall near the telehealth system allows users to keep track of the time.

Finally, furniture that may be needed in a telehealth studio include a table, chairs, stretcher or examination bed, a small general purpose table to hold a fax machine and telephone and a coat rack. The table and chairs should be of light to medium color to allow light to reflect people's faces. Chairs that roll will make it easier (and quieter) for all participants to position themselves in front of the camera, but these types of moving chairs may not be appropriate to use in space hosting clients for clinical telehealth.

Centrale-healthunit

Private polyclinic, which will be the Central Health Unit of the COMETECH Program and in which the telemedicine devices of the program will be installed and will operate. The Private Polyclinic should be located in the city of Thessaloniki and have a legal license. In order to meet the needs of the program, you must have:

1. Patient waiting room.
2. Sanitary facilities, WC separately for men and women.
3. In case it is on the first floor, to have in addition to the staircase and elevator so that it is accessible to people with special needs.
4. The following sections:
 - A. Internal Medicine
 - B. Endocrinology
 - C. Ophthalmology,
 - D. Nephrology,
 - E. Cardiology.
4. A physician specializing in diabetes and with experience in telemedicine, who will have the role of coordinator of patient examination.
5. Dietitian.
6. Nurse or technologist of medical laboratories. The polyclinic will examine 400 patients from Thessaloniki by the above health professionals, but will also have the obligation to provide medical tediagnosics and counseling

for 200 patients, who will be examined at the Hospital of Florina who will participate in the program.

Patients will be examined by 7 health professionals (Physician specializing in diabetes, endocrinologist for obesity, ophthalmologist for bottom photography, cardiologist for cardiological examination and electrocardiogram of pediatric dialysis, nephrologist for renal function assessment

CONCLUSIONS

Telehealth and telehealth have evolved quickly over the past few years, suggesting that they will continue to develop at a rapid pace. As technology advances and organizations become more familiar with platforms and service options, minimum built-environment standards to support these practices may need to be refined. Moreover, even some of the most prestigious health care systems in the country acknowledge that they learn from their mistakes and make necessary corrections to the physical environment or communications equipment – an approach not all organizations may be able to afford.

As Krupinski (2014), argues *“The environments within which healthcare interactions take place are going to be as varied as the providers and patients, but the fundamental concerns and principles about creating spaces that facilitate clear, open and caring communication should guide our efforts to successfully -and with proper integrity, security and respect for privacy- reach out and connect with those who need care: anywhere, anytime”*.

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