POLSKI
PRZEGLĄD CHIRURGICZNY
2016, 88, 3, 125–129

10.1515/pjs-2016-0039

DE GRUYTER
OPEN

ORIGINAL PAPERS

# PHOTOGRAPHIC DOCUMENTATION IN PLASTIC SURGEON'S PRACTICE

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**The aim of the study** was to analyze practices of clinical photographic documentation management among plastic surgeons in Poland as well as to gain their opinion about the characteristics of "ideal" software for images archiving.
**Material and methods.** The on-line survey link was send (via e-mail) to all members of Polish Society of Plastic, Reconstructive and Aesthetic Surgery. From 187 members, 86 subjects (47.5%, 54 men and 32 women, of the mean age 40.8 years ± 10.6 years) filled in the on-line questionnaire, which constitutes a representative sample of plastic surgeons practicing in Poland.
**Results.** The study showed that only 7% of plastic surgeons use IT applications dedicated to archiving photographs. Instead, more than half of them store photos in ordered folders on computers. The majority of respondents (89.3%) are interested in using a dedicated computer application to archive photographic documentation. The most important features, which an application of this type should have are (265 answers): quick search (26%), easy to use (24%), quick data entry (22%), data security (15%), an ability to print selected data (7%), availability only to authorized employees of the unit (5%).
**Conclusions.** Cooperation of health care providers with informatics may lead to the conceptualization of a program fulfilling the requirements of specific medical groups. On the basis of the questionnaire study we have collected the data necessary to create the concept of the unique software that would be useful for clinical practice of plastic surgeons as well for other specialists dealing with photographic documentation.
**Key words:** photographic documentation, computer software, plastic surgery

Photographic documentation was first widely used in publications in the areas of dermatology and plastic and reconstructive surgery, where the inclusion of images is recognized to enhance the descriptions of diagnoses and procedures (1). Taking consistent and valid photographs is involved in plastic surgeons' everyday activities. Photographic documentation is crucial in plastic, reconstructive and especially in aesthetic surgery for many reasons – clinical and scientific (2). Photographs are commonly used in preoperative planning, as visual reference during surgery, for critical evaluation of outcomes, data exchange, teaching, publications, and presentations (2). It is an unquestioned fact that reliable and comparable photographic documentation is based on specific standards defined decades ago (2-6). This criteria include: camera angles, posing position, background, photographic section and many others (7).

Nowadays, the obtained images are usually stored and used as digital files, they are rarely

printed and analyzed "in paper". This kind of archiving and storing images is advantageous in terms of time and space. Moreover, computerized databases facilitate data retrieval and eliminate the need for transporting loads of photographs. Economic aspects are also to be highlighted as using digital format reduces costs of printing and documents safe archiving (2). Visualization of pictures on the screen allows precise preoperative and postoperative assessment with the use of different tools like eg. zoom or some measurement tools dedicated to indirect anthropometry purposes. In recent years the evolution of photo editing software has been observed. They offer a wide range of tools for photographs standardization and modification. Some of them enable save files archiving and easy access to needed data.

Currently, in Poland there are no guidelines for plastic surgeons related to photographic documentation standardization, storage and archiving. Most of the university's plastic surgery clinics as well as private centers keep such records and use them for clinical and scientific purposes. However, the practices of files preserving and ensuring their safety differ between centers. Moreover, due to the legal requirements concerning computerization of medical records, many different systems were introduced, however most of them are not adopted to plastic surgery specificity, so they are not able to store image files because of their size and number. Similar problem was faced by radiologists and solved by using additional software dedicated to high-resolution images management.

The aim of the study was to analyze management practices of clinical photographic documentation used by plastic surgeons in Poland. We also aimed to gain their opinion about the characteristics of "ideal" software for images archiving.

## MATERIAL AND METHODS

The on-line survey link was send to all members of Polish Society of Plastic, Reconstructive and Aesthetic Surgery (PSPRAS) via e-mail. The Chairman of the Association approved the concept of the study. E-mails to all registered members with the link to the survey and information about the aim of the study were sent from official Society's mailbox. Currently, there are 187 members of PSPRAS (181 active: 125 specialists, 56 in training, and 6 honorary members). Honorary members were not included in the study. From this group 86 subjects (47.5%, 54 men and 32 women, of the mean age 40.8 years ± 10.6 years) filled in the on-line questionnaire, which constitutes a representative sample of plastic surgeons practicing in Poland.

### The Questionnaire

The questionnaire was designed by plastic surgeons with co-operation with the informatics specialists. It included 21 questions and some of them took into account the possibility of multiple choice. The questions were related to respondents' characteristics (age, sex and specialization status) and their practices in photographic documentation management (if they keep photographic records on regular or random basis, who is responsible for photographs performance and management, if the photographs are standardized – the same distance, position, projections etc., how reliable is the documentation – on the 10- point scale, how images are archived, if is it easy to find a needed image and how much time it takes).

Moreover, we included questions concerning the role of photographic documentation in plastic surgeons' practice: when it is most commonly used (2 main reasons to choose from: for scientific purposes, to assess the results of treatment of individual patients, in case of patients' claims e.c. in the Court, to monitor the course of a disease and treatment, other reasons), how important it is in clinical practice – on the 10-point scale, is photographic documentation helpful in case of patients' claims and if respondents have dealt with patients' claims.

The last part of the survey referred to the respondents' interest in a software dedicated to the images storage and the characteristics it should possess: if they would be interested in having such program, what are three the most important features of the "ideal software" from the following: easy to manage, fast data enter, fast data searching, ability to print images in the chosen configuration, personal data safety, protected access to the files, what searching criteria it should offer: name, sex, age, diagnosis according to the ICD-10, body area, others. We also asked how much time

daily surgeons are able to spend for creating and archiving images.

## RESULTS

Representativeness of the sample was verified on the basis of the two-step procedure. The analysis was based on a comparison of sex status structure of the respondents who participated in the study (86 observations) and all practicing plastic surgeons in Poland (181 active members of PSPRAS). The high value of structures' similarity indicator (95.50%) confirms the high degree of similarity of the analyzed populations. In the second step chi-square test was performed ($p>0.05$). In summary, the structure of respondents' sex status showed that the sample is representative for the plastic surgeons in Poland.

### Photographic documentation preparation and its role in plastic surgeons practice

It was found that almost all respondents keep photographic records (97.7%, 84/86) in their clinical practice and most of them (90.5%, 76/84) do it on regular basis, while the rest (9.5%, 8/84) occasionally. Answers from the two subjects, who do not keep such documentation were not included in further analysis as they did not answer most of the questions. Most commonly the photographs are done and archived by the surgeon involved in the treatment (59.5%, 50/84). Professional qualified photographer is responsible for this documentation in 28.6% (24/84) plastic surgeons' clinical practice. Rest of the respondents rely on non-professional photographers (6%, 5/84) or one surgeon chosen from the team (6%, 5/84). Most of the surgeons (81%, 68/84) reported that their photographic documentation is definitely (33.3%, 8/84) or rather (47.6%, 40/84) standardized (the same projections and distances). Four respondents did not have any opinion about it, while 14.3% (12/84) claimed that the images performed in their clinics are rather not standardized. Reliability of photographic documentation assessed on 10-point scale appeared to be rather high as the mean score was 7.7 points. The most common note was 8 (27.4%, 23/84), while only five surgeons evaluated it as less than 5 (fig. 1).

In the question were the respondents were asked to choose maximum two most important situations, when they need photographic documentation, all of them pointed two items (168 answers). The most frequently chosen situations were: to assess the results of treatment of individual patients (38.7%, 65/168) and for scientific purposes (28.6%, 48/168). Other situations when surgeons need to use such documentation are: in case of patients' claims e.c. in the Court (19%, 32/168) and to monitor the course of a disease and treatment (13.7%, 23/168). The importance of photographic documentation in clinical practice according to the respondents was evaluated on the 10-point scale. Most of them assessed it as "very important" (10 points) (72.6%, 61/84) or "important" (7-9 points) (26.2%, 22/84). Only one respondent pointed out that photographs are not important in his practice. Almost 74% (62/84) of the studied surgeons reported that they dealt with patients' claims related to unsatisfactory result of the operations. Asked if photographs are or may be helpful in such cases, 95% (90/84) answered positively.

### Photographic documentation archiving and IT applications in plastic surgeons practice

The respondents were to choose all tools and ways used to archive photographic documentation (multiple choice variant question). The results of the study confirmed that only a small percentage of plastic surgeons use IT applications dedicated to archiving photographs (7%, 6/84 respondents, 5%, 6/121 responses). Instead, more than half of them store photos just

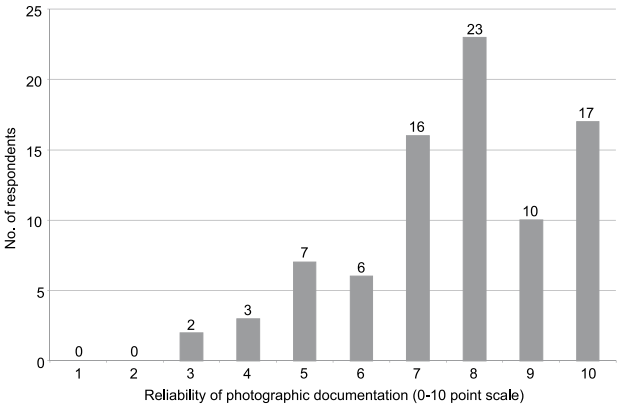


Fig. 1. Assessment of photographic documentation reliability on 0-10 point scale (0 – very bad, 10 – excellent) in respondents opinion

in ordered folders on computers. Folders are typically ordered by name and surname, date or kind of surgery. Moreover, some surgeons attach photos to the history of disease, some of them store photos in catalogs in paper form, some of them use catalogs in mobile telephones (defined as "other ways"), and finally some of them do not have a specific way of archiving photographs (fig. 2).

The majority of respondents (89.3%, 75/84) are interested in using a dedicated computer applications to archive photographic documentation. According to the surveyed surgeons, the most important features of such application should be as follows (each respondent could point at maximum three the most important characteristics and 265 answers were given): quick search (26%, 70/265), easy to use (24%, 64/265), quick data entry (22%, 58/265), data security (15%, 40/265), the ability to print (7%, 19/265), availability only to authorized employees (5%, 12/265). Only 1% of answers pointed out other features (fig. 3). Some of the obtained results can be explained by the fact that over 80% of the respondents can not spend at work more than 15 minutes to create and archive photographic documentation. Moreover, it turned out that the most desirable feature of the application is a possibility to quick data search (nearly half of respondents usually spend 15 minutes or more to locate a particular photograph). According to the surgeons, the desired search criteria of an application for archiving photographs are (multiple choice variant question, no limit of the alternatives' number, 296 answers given): name and surname (28%, 83/296), clinical diagnosis (26%, 78/296), the

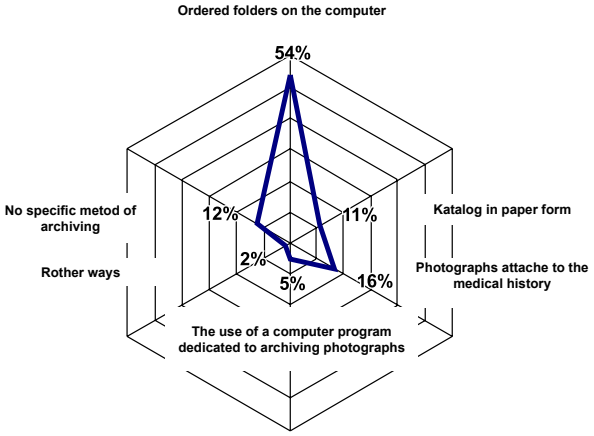


Fig. 2. Methods of archiving photographic documentation

area of the body (17%, 49/296), sex status (13%, 37/296), age (12%, 36/296), and others (4%, 13/296 – type of the surgery or other treatment, personal identity number, the date of photo, the date of surgery, medical record ID) (fig. 4).

## DISCUSSION

To our knowledge, the presented study is the first dealing with the issue of photographic documentation archiving practices among plastic surgeons in Poland as we have not found such report in the available literature. In all hospitals in Poland there is a specific software used for medical records preparation and archiving (ec. Hipocrates©, Esculap©) based on internal servers. Additionally, there are different programs used by radiologists, which store large files (magnetic resonance, computer tomography, PET files). These pro-

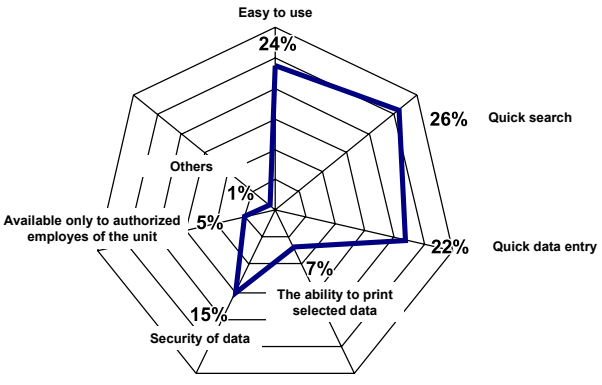


Fig. 3. The most important features that an application to archive photographic documentation should have (respondents could choose more than one item)

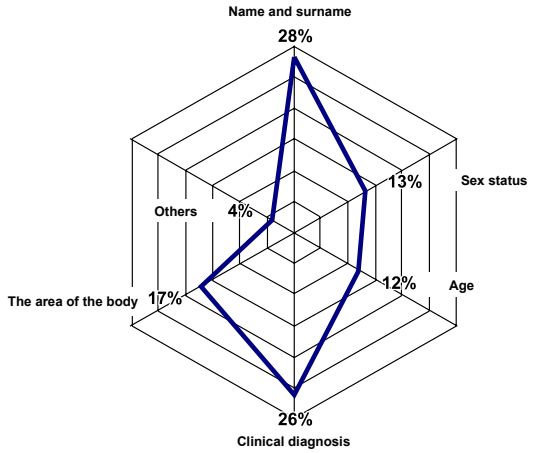


Fig. 4. The search criteria, which an application for archiving photographs should have (respondents could choose more than one criterion)

grams are usually integrated with the basic software and enable to combine images with other medical data. Apart from internal hospital programs there are different commercial tools dedicated to photographic documentation creation, standardization and archiving. However, due to economic and "practical" reasons their use in hospitals is limited.

Considering the results of the conducted study some important questions arises. First of all it is interesting why plastic surgeons do not archive photos in commonly encountered hospital information systems (HIS) (8, 9, 10). According to the authors it may be associated primarily with difficulties in handling in these systems a large number of large files, like photographs collected for plastic surgery patients. Such documentation usually includes many images in different patients' positions and needs to be of the highest resolution. Moreover, many plastic surgeons highlight that this documentation should be secured and available only for the authorized employees (20% of the answers), which indicate their reluctance to share this sensitive data to other staff of the healthcare facility. Our data showed that only 7% respondents use specific software for photographic documentation archiving while almost 90% would be interested in using such programs. Most of HISs used in Poland do not enable large files storage and specific programs dedicated for plastic surgery purposes are expensive. Most of hospitals do not provide the staff with such tools. This results with different other ways of archiving photographs, as their role in clinical practice cannot be denied. The respondents usually store photos in folders in hospital computers using different criteria of their organizing. However, this solution does not seem to be ideal, as it is time-consuming (preparing documentation and searching for specific files), requires large disks and there is a possibility of loss of some data. Documentation's safety can also be questioned as it depends only on the computer's security. Moreover, there is also an important aspect of expected possibility to combine photographs with other clinical data archived in HIS. Respondents claimed that apart from patients' names, they would like to have more clinical information "attached" to the image, especially clinical diagnosis.

## CONCLUSIONS

To sum up, the presented study highlights the need of cooperation of health care providers with the informatics. Such collaboration may lead to the development of the programs meeting the requirements of a specific medical groups. On the basis of the questionnaire study we collected the data necessary to create the concept of the unique software that would be useful in clinical practice of plastic surgeons and also other specialists dealing with photographic documentation.

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