

How to Present Your Research Findings at a Scientific Meeting

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The next step following acceptance of an abstract submitted for a scientific meeting is to create the poster. Poster presentations provide an avenue for dissemination of research findings as well as the opportunity to highlight the work and network with other clinicians. Requirements for poster presentations vary among scientific meetings. Therefore, it is important to follow instructions set forth by the specific conference at which the work will be presented. Important considerations for poster design include the elements it should contain, font type and size, use of tables and figures, and poster size. Research indicates visual appeal has a greater influence in attracting attention than content. In addition to creating the poster, preparing for presentation is an essential step in the process. Practicing the presentation prior to the meeting, anticipating questions, and being familiar with the poster content are principal factors in preparing for the presentation. Oral presentations for posters are typically brief and should only focus on the key points. The purpose of this paper is to review poster design and provide general guidelines for presenting an abstract at a scientific meeting. *Key words: abstract; poster; scientific poster; poster presentation; poster rounds; scientific meeting; conference; research; professional development; networking.* [Respir Care 2023;68(11):1598–1605. © 2023 Daedalus Enterprises]

Introduction

Research findings are often presented in abstract form at scientific meetings.^{1,2} After formulating the research question, performing the study, and writing the abstract, usually the next step is to create the poster following acceptance of the abstract.^{1,3,4} Posters provide an avenue for disseminating research findings through visual display and are considered an effective method of knowledge transfer.^{5–7} Dissemination of research findings through publication is an essential component of the research process.² Formal research training, including poster presentation, may not be included in the education curriculum for some health care disciplines.⁸ The aim of this paper is to provide guidance to clinicians for creating and presenting a scientific poster.

Poster presentation sessions provide an opportunity to highlight the work, network and collaborate with other clinicians and researchers, and learn about the work of others. It may also stimulate ideas for new research projects or spark collaborations with colleagues from other centers. Presenting the work provides feedback that could be helpful for writing the manuscript (the step after poster presentation) or for further study. Abstract acceptance and poster presentation may lead to career advancement, and it may provide institutional support for funding conference attendance.⁹ Most importantly, participating in research, writing an abstract, and presenting a poster contribute to the science and practice of the profession.²

Scientific meetings that host poster sessions generally provide guidelines for poster design and presentation.

Instructions vary among conferences, so it is important to follow instructions set forth by the specific meeting. Design is a key factor for creating the poster. An aesthetically appealing and easy-to-read poster with a logical flow is fundamental for designing a poster that attracts attention and engages discussion. Visual appeal is often more influential in drawing attention to a poster than the content.^{5,10}

Poster sessions may be standalone or accompanied by a brief oral presentation. Some clinicians find poster sessions to be a more relaxed environment for presenting research findings as compared to other types of presentations.¹¹⁻¹³ Other variations for presenting an abstract may not involve a poster but rather slides with additional time for oral presentation. Regardless of the type of session, authors should be prepared to not only present the findings but also engage in discussion. Questions from attendees are to be expected, and clinicians should be prepared to respond.^{9,13,14} Oral presentation of posters and abstracts is typically brief and focuses on the key points as opposed to reading the details of the abstract.

Poster Design

Instructions and guidelines for poster presentation are often included with the acceptance notification of the abstract or are available on the organization's web site.¹⁵ Since requirements vary among scientific meetings, it is imperative to follow the instructions for the specific meeting at which the poster will be presented.¹³ Information and instructions for poster presentation for the Open Forum sessions at the American Association for Respiratory Care Congress are provided on the RESPIRATORY CARE web site (<https://rc.rcjournal.com>). A poster template is also available for download to use as a guide (Fig. 1). The template includes both the required and optional elements to include on the poster. Although the required and optional items discussed in this paper are specific to the Open Forum, these elements are also commonly found in other scientific meetings.

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Required Elements

The main elements required for a poster are the same as for the abstract: title, background, methods, results, and conclusions. The specific components for each of these sections were described previously.¹ Additionally, author names, affiliations, and disclosures are required. All of these items are standard elements of a scientific poster. Some meetings may require a section for objectives, purpose, or specific aim.^{9,13} These items can be incorporated as part of the background section when there is not a requirement to include them separately.

Place the title at the top of the poster in title case. Title case does not include use of all uppercase letters but rather capitalization of major words such as nouns, verbs, and adjectives, whereas minor words are in sentence case (all lowercase). The title of this paper is formatted in title case on the first page. Author's first and last names are placed under the title without degrees or credentials.

Many journals, including RESPIRATORY CARE, no longer publish author degree and credential information. This includes published manuscripts as well as conference abstracts. There are several reasons for this practice. One is to reduce unconscious bias and not presume merit of the work solely based on author degrees or credentials. However, the International Committee of Medical Journal Editors guidelines are vague on this topic, stating that journals should establish their own policies regarding publication of author degrees.^{16,17} An evaluation of 100 high-impact journals found that only 24% published author academic degrees, and the practice was more common in North American journals (42%) than European journals (8%).¹⁷ Other issues with publishing author degree and credential information are that some clinicians may have multiple credentials and may not report them correctly.¹⁸ Including all academic degrees and credentials for multiple authors can occupy a substantial amount of space and appear cluttered. Additionally, it is not feasible to verify this information for accuracy for all submissions.

The affiliation for each author should be included beneath author names. Affiliation details indicate the institutions or organizations represented and often where the research occurred.¹⁹ When there are multiple authors with different affiliations, a common practice is to utilize a superscript numeral after each author's name, similar to citing a reference within a manuscript. This helps keep the author list uncluttered and then clearly links each author to a specific affiliation. If all authors have the same affiliation, it is acceptable to include the affiliation name(s) below author names without superscript numerals.

Information for the background, methods, results, and conclusions sections can be taken from the accepted abstract and expanded to include additional details. Avoid merely copying the text of the abstract to the poster, and do not include the abstract as a separate section on the poster.^{12,13,20}

Title Here in Title Case

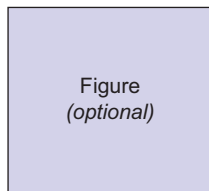
Hospital logo allowed, NO commercial/industry logos

Authors (first name last name only, *no degrees/credentials*)

Affiliation(s)— Department, Hospital, City, State/Province, Country (if other than United States)

Background

- The background includes what is known about the topic
- State the research question
- State the hypothesis (if applicable)
- State the purpose of the study
- Avoid describing commonly known respiratory terms
- Bullet points make the text easier to read and more concise
- Avoid long paragraphs of text



Methods

- Methods includes details about how the study was done
- Type of study
- How subjects were identified
- Identify population
- Equipment and settings used for bench evaluations
- Use figures to illustrate experimental set-up, study design, or other items used in the study
- Other pertinent details that may have been character limited in the abstract
- Primary and secondary outcomes
- Statistical analysis used to analyze results

Table (optional)			
Header	Header	Header	P value
1	A	50%	< .05
2	B	35%	.13
3	C	75%	.02
4	D	98%	<.001

Results

- Results describe the study findings
- Number of subjects enrolled
- Demographic data
- Outcome data
- Subgroup analysis
- Use figures and/or tables to substitute text

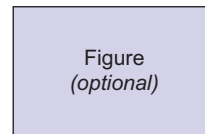
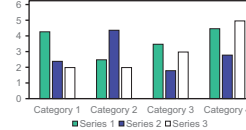


Chart (optional)



Conclusions

- Conclusions summarize the main findings
- Implications for clinical practice
- Do not overstate findings
- Do not include data not reported in other sections

References (optional)

1. Hess DR. Evidence-Based Respiratory Care. *Respir Care* 2021;66(7):1105-1119.
2. Hess DR. Research and Publication in Respiratory Care. *Respir Care* 2023;68(8):1171-1173.
3. Miller AG. How to Write an Abstract for Presentation at a Scientific Meeting. *Respir Care* 2023;68(11):1569-1575.

Acknowledgments (optional)

We thank _____, and _____, for their assistance, etc.

Disclosures

- All authors conflict of interest (indicate none, if none)
- All research funding, sponsorships, provision of equipment, or other financial support (indicate none, if none)

Fig. 1. Poster template.

Although this was required in the past,²¹ including the abstract on the poster is no longer recommended because accepted abstracts are often published online and easily accessible. Abstracts accepted for presentation in the Open Forum since 2009 are available online (Past Open Forums: <https://rc.rcjournal.com/content/past-open-forums>. Accessed May 4, 2023).

Because abstracts are character limited, there are often some details or specifics not included. The poster affords the opportunity to incorporate additional points not noted in the abstract due to content restraints. However, keep in mind that the poster is not and should not be a mini manuscript.^{22,23} Long paragraphs of text make it difficult for attendees to review the information, and they may lose interest and move on to the next poster.¹⁴ Use of bulleted points and short phrases with concise key points instead of long, complete sentences can help simplify the text and make it easier to read.^{13,14,22,23} Figures are useful to illustrate methods such as equipment utilized and experimental design. Flow charts can be helpful to describe processes for methods. Tables and figures offer an efficient approach for presenting results to substitute and minimize text.

Disclosures are a required element. There are 2 components of the disclosure section: conflict of interest and funding.

Conflict of interest includes financial or personal relationships or affiliations that could influence or bias the research. It is important to note that declaring a conflict of interest does not imply there is an issue or problem but rather provides transparency for the reader to make their own judgment in relation to the content of the work.¹⁶

All potential conflicts for each author must be stated. Examples include industry relationships such as receiving honorariums or research funding or if an employee of industry. Conflicts of interest unrelated to the present study must be disclosed. *RESPIRATORY CARE* requires reporting of potential conflicts of interest with the past 2 years (<https://rc.rcjournal.com/content/author-guidelines>. Accessed April 28, 2023). It is not necessary to provide the nature of the relationship but only the name of the entity for which the relationship exists. Any funding or sponsorship used to support the study must also be disclosed. The details of the funding, such as amount, are not required, only the name and type of support. Funding is not limited to monetary support as it is not uncommon for manufacturers to provide equipment or supplies used in a study. The disclosures section is often overlooked when creating the poster, especially when there are no disclosures to report. If an author does not have any conflicts to disclose or no funding was

received for the study, the disclosure section should state as such for each aspect. It can be as simple as stating “Disclosures: none” when there are no conflicts of interest or funding.

Optional Elements

Optional elements that may be incorporated in the poster include tables, figures, references, acknowledgments, and logos. Institutional or hospital logos are generally allowed, but commercial or industry logos are usually prohibited, the latter being the case for posters included in the Open Forum. Many academic institutions and hospitals often have their own template and logo that employees may be required to use for poster presentations.¹³

Although optional, use of tables and figures is encouraged. These items provide visual details that can effectively convey information and substitute text.¹³ Figures should be self-explanatory and not overly detailed or complicated.^{13,20} Label all figures appropriately with a title or description and include axis titles for charts and graphs. Utilize good-quality images with clear resolution that do not appear grainy or pixelated when resized.^{20,24}

If graphics include humans, ensure appropriate permissions have been obtained. Borrowed imagery may be subject to copyright protection.^{15,24} An observational study that aimed to investigate quality of posters on display at a national scientific meeting revealed that only 29% of all posters had properly referenced images.¹⁵ Crediting the source of the image does not necessarily entitle use. Images or photographs not originally created by the authors must have permission as applicable. Some imaging may be licensed for certain uses without first obtaining permission. It is the responsibility of the authors to ensure appropriate use of all images. Information regarding copyright laws can be found on the web site of the United States Copyright Office (<https://www.copyright.gov>. Accessed May 4, 2023).

If references are cited, include only key publications related to the study.¹⁹ In recent years, some authors have utilized the quick response (QR) code for references. QR codes can be easily read with a smartphone or other digital device to provide instant access the list of references, thus saving space on the poster for other items. There are numerous online services available to generate a QR code.

Acknowledgments are used to thank individuals who contributed to the work but are not eligible for authorship. General guidelines for acknowledgments are to name the individual(s), the type of contribution, institutional affiliation, and obtain their permission since including them could be perceived as an endorsement of the work (RESPIRATORY CARE author guidelines: <https://rc.rcjournal.com/content/author-guidelines>. Accessed April 28, 2023). Author contact information is another optional element to consider for the poster. Some authors may choose to include an e-mail

address to facilitate communication with other clinicians after the meeting if additional information is requested or for potential collaboration.^{9,25} Fifty-five percent of survey respondents regarding attendee perceptions of poster sessions felt that presenters should provide business cards.¹⁰ Author contact information may be required for posters by some scientific meetings.¹⁵

Rule of 10s

The average person will scan a poster for about 10 seconds from a distance of 10 feet to decide if they want to stop and learn more.^{9,22,23,26} Two separate studies that evaluated perception of posters displayed at different scientific meetings identified visual appearance as the main reason for an attendee to visit a poster.^{5,10} If a poster is cluttered, contains long paragraphs of text, or difficult-to-read font, some attendees may be less likely to visit the poster. Bullet points can help make the text concise and focus on key points. Do not use an acronym without first identifying the meaning. Avoid using jargon and limit use of acronyms that can make the poster harder to follow.

Ensure the layout of sections flows logically and in order. Since most people read from left to right and from upper to lower, it is recommended to begin the sections of the poster on the upper left and finish at the bottom right using 3 columns.^{13,20} Although the poster expands on the abstract, avoid trying to include too much information or too many illustrations that can make the poster appear busy and cluttered.¹³ Some recommendations propose that at least 30% of the poster should be empty space between sections with 40–50% for graphics and no more than 25% for text.^{13,24}

Font size for the title should be legible and easily read from a distance of 10 feet and the text from 3–5 feet.^{9,23} It has been suggested to use no more than 3 different font sizes for uniformity.¹³ In addition to font size, the font style and type are also important. Sans serif style font types have been recommended as they tend to be simple and easy to read.^{13,20,23} Artistic fonts and use of all uppercase are discouraged since they are more difficult to read and can be distracting.^{12,13,20}

Use of colors can assist with improving visual appeal, but try to limit to 2–3 colors.²⁴ Avoid red and green combinations when possible as people with color blindness have difficulty with this grouping of colors.^{13,24} It is acceptable to be creative in designing the poster, but ensure all requirements for the specific meeting are met and that the scheme is balanced, appropriate, and not overly busy. Table 1 includes a summary of recommendations for designing the poster. Examples of poster design, including how not to design a poster, are provided in supplementary materials (See related supplementary materials at <http://www.rcjournal.com>).

Table 1. Poster Design Recommendations

Do	Do Not
Follow the meeting instructions	Create the poster without reviewing meeting instructions
Use the rule of 10s for readability	Include author degrees or credentials
Use appropriate font size and type	Include the abstract on the poster
Use tables and figures to substitute text	Use long paragraphs of text
Include a title for tables and figures	Use artistic fonts or all uppercase text
Label all figure components	Use distracting color schemes
Consider use of bullet points for easy-to-read text	Use acronyms without first defining them
Ensure logical flow of sections	Overuse graphics making the poster busy and cluttered
Use a simple color scheme for visual appeal	
Leave some empty space	
Consider including contact information	

Poster Production

Plan ahead, be mindful of deadlines, and do not wait until the last minute to make the poster. Some meetings may require submission of the poster prior to the event. Allow plenty of time not only to create the poster but also for review, revision if needed, and for printing. Clinicians should check with their department to determine if there is a template or logo required by the institution for employees to use.¹⁹

An important step in creating the poster is to first review and follow the requirements set forth by the scientific meeting as this often varies for different organizations.^{13,15,19,24} Assessment of 485 posters evaluated at 4 different conferences identified substantial variation for adherence to meeting guidelines.²⁷ Another study found that only 72% of posters met display criteria specified by the conference.¹⁵

One of the most common ways to create a poster is to use a program such as PowerPoint (Microsoft Corporation, Redmond, Washington) or similar platform.^{9,13,19} The template provided for the Open Forum utilizes this format (Fig. 1). Once the poster has been drafted, it should be reviewed by all authors to ensure names and affiliations are correct and to review for typographical and grammatical errors before finalized and printed. More than 1 in 5 posters evaluated at one conference were noted to contain basic typographical errors.¹⁵ If the poster only has one author, it is highly recommended to have a colleague or other individual review before printing to avoid these types of issues.

Many hospitals and academic institutions typically have graphical or media departments that can print posters or have access to a facility for printing. If this service is not available through the employer, there are numerous retail stores and online services offering poster printing. The cost varies by size and type of print. Glossy prints have traditionally been the most common type of poster print utilized. Cloth and vinyl are other options but may cost more than glossy-style posters. The recommended poster size is usually specified in the meeting instructions. For Open Forum, the maximum size is 66 inches wide by 40 inches high. Posters do not have

to be this size, but they cannot be larger or otherwise may not fit on the provided display board. The smallest size to consider is 48 inches wide by 24 inches high, as anything smaller will be difficult to read if following the rule of 10s.

If printing the poster is cost prohibitive, use of mounted cards offers a low-cost alternative. PowerPoint or another similar program can be used to create a slide for each section that can be mounted on poster board.²¹ Sections can be printed on individual sheets of paper that can be laminated.²⁰ Laminating sheets is fairly inexpensive and does not require special devices or equipment to apply and may eliminate need for poster board. Although mounted cards are an option for poster display, the single-sheet printed poster is considered more sophisticated and is more commonly used.²⁰ Visual appeal may be impacted if mounted cards are used, and it may be challenging to use large enough font that can be easily seen from a short distance.

Some conferences utilize electronic format to display posters.^{13,19,24} This became more prominent during the COVID-19 pandemic when many scientific meetings temporarily transitioned to a virtual format.²⁴ The main benefits of electronic display are lack of need for printing and more convenient travel. As technology continues to evolve, it is likely that electronic posters will eventually replace printed versions in the future. When the pandemic led to the American Association for Respiratory Care conference to be virtual for the second year in a row in 2021, Open Forum presenters had the option to submit their poster to include online with the published abstract. All posters had to meet the specified requirements before made available online. Although the conference returned to in-person the following year, the practice continued due to its success. This allowed clinicians to share additional details of their work with other clinicians unable to attend the poster session or the meeting.

Traveling to the meeting with the printed poster is another consideration. Various types of poster holders or tubes constructed of different materials are available to protect the poster during travel. If the clinician's department or

Table 2. Poster Preparation Considerations

Poster Preparation
Ensure all authors have reviewed the poster before finalizing and printing
Proofread for typographical and grammatical errors
Print the poster within the specified size
Plan for travel
Be familiar with the poster content, similar work, and related literature on the topic
Practice the presentation with peers or colleagues for feedback prior to the meeting
Anticipate attendee questions and prepare a response

institution frequently supports poster presentation at scientific meetings, they may have poster storage tools available for employee use. For air travel, it is recommended to take the poster as a carry-on versus checked baggage to minimize the risk of it becoming lost.¹³ Before leaving to travel, consider the poster part of the checklist of items to take so it is not forgotten at home.

Cloth posters are convenient for travel as they can be folded and packed in luggage or carry-on bag. If packing a cloth poster, ensure there is a way to remove any wrinkles that may occur and have a backup plan in the event checked luggage is lost. Another option to consider is on-site printing with a service located where the meeting will be held. This eliminates carrying the poster during travel, but be mindful of any potential deadlines that may apply for retail printing services and the cost. Shipping the poster to the conference center or hotel is another strategy to consider; however, it is important to inform the facility the poster will be arriving, and some sites may charge a fee to store the poster.

Some recommendations are to include small printed copies of the poster or summary handouts for interested attendees.^{10,11,13} Sixty-eight percent of survey respondents regarding perceptions of poster sessions indicated a preference for having a copy of the poster to take home.¹⁰ Some attendees take a picture with a smartphone or other digital device of posters they are interested. Another option is to include a QR code that provides access to the full poster or other supplementary materials.^{13,24} A number of scientific meetings now offer to publish an electronic version of the

poster along with the abstract, as has become the practice for the Open Forum, making the poster easily accessible after the conference. Table 2 includes the primary considerations for poster preparation.

Poster and Abstract Presentation Formats

There are different types of poster and abstract sessions at scientific meetings with varied formats. Some of the most common types include standalone, poster rounds, poster presentation, and abstract presentation. Table 3 includes a summary of the different types. The standalone poster consists of poster display that may or may not require author presence at designated times to interact with attendees and answer questions. This type of format does not involve formal oral presentation but if attended will require interaction with attendees. The disadvantage of unattended posters is the lack of engagement between author and attendee may limit knowledge transfer and understanding of content.^{5,9}

Poster rounds are similar to standalone sessions in that they are less formal than poster presentations, but authors have a designated time to attend their poster. In addition to attendees visiting posters, a moderator typically visits each poster assigned to the session and discusses the work with the author. In this setting, the author should have a brief oral presentation prepared for the moderator. Oftentimes, a group of attendees will follow the moderator, and this can generate additional discussion. Some clinicians prefer this type of poster session as it is perceived less intimidating than standing in front of a podium.

The format for poster presentation sessions varies among scientific meetings. In general, the first portion of the session is dedicated to poster viewing and interacting with attendees visiting the poster, whereas the second part is for oral presentation and questions from the audience. Poster presentation sessions usually have one or more moderators to facilitate oral presentation. Moderators will also visit posters during the viewing portion of the session and engage in discussion. During the second part of the session, each presenter provides a brief oral presentation at the podium followed by questions from session attendees and the moderator(s).

Table 3. Summary of Presentation Formats

Standalone Poster	Poster Rounds	Poster Presentation	Abstract Presentation
Poster viewing attended or unattended	Attended poster viewing	Attended poster viewing	May or may not include poster, poster viewing, or slides
If attended, author discusses poster with attendees	Attendees and moderator visit poster	Attendees and moderator visit poster	May include poster display or slides during oral presentation
No formal oral presentation	Brief oral presentation for moderator and attendees at poster (2–3 min)	Brief oral presentation at podium (2–3 min)	Short oral presentation at podium (10–15 min)

Some scientific meetings utilized electronic poster formats prior to the COVID-19 pandemic, with posters displayed on a large monitor.^{13,19} Oral presentations are either pre-recorded and incorporated into the electronic display, or the presenter is scheduled for a designated time frame to stand beside the display and engage in discussion.^{13,19} The disadvantage to this approach is the added cost of renting monitors for the meeting organizer, and it may limit the number of posters that can be displayed in this manner.^{13,20} During the COVID-19 pandemic, some conferences hosted an online gallery of posters.²⁴ Different variations included a discussion board for questions and recorded or live presentation followed by live question and answer session.²⁴ In the future, it is anticipated that electronic poster display will become standard at scientific meetings as technology continues to advance and change.

As with poster sessions, the format for abstract presentation also differs among scientific meetings. Abstract presentations may or may not include posters or a poster-viewing session. Some abstract sessions utilize slides instead of a poster. In general, abstract presentations are often allotted additional time for oral presentation and discussion as compared to poster presentations. This type of presentation is also facilitated by one or more moderators.

The Open Forum offers both poster rounds and poster presentations. Authors choose their preference for type of poster session at the time of abstract submission. Authors of accepted abstracts are invited to provide an electronic copy of the poster to include online with the published abstract. A select number of abstracts accepted for presentation in the Open Forum are designated Editors' Choice. Instead of a poster, slides are prepared for Editors' Choice abstract presentations and must be submitted prior to the conference.

Presentation

Regardless of the type of session, preparing for presentation and engaging in discussion about the work are equally important as designing the poster or slides. If the poster session does not involve formal oral presentation, clinicians should still prepare for discussion and be able to answer questions about the work. It is important to understand that acceptance of the abstract is not an endorsement or validation of the work.^{25,28} Validation of the research findings occurs through presentation, scrutiny, constructive feedback, and good discussion.^{25,28}

Maintain a professional appearance and dress appropriately for the poster session.^{13,19,20} Be prepared and ready to deliver the take-home message succinctly and efficiently during poster viewing and presentation.^{20,25} When introducing the work during poster viewing, do not read the poster to the attendee and only refer to the poster when needed for clarity of data.²⁸ Be prepared to describe the work and provide the main points in one minute or less.²⁸

Oral presentation for poster rounds with the moderator and formal presentation at the podium should be brief, usually lasting no longer than 2–3 min unless otherwise stated in the meeting instructions.^{11,13} Do not read the abstract during an oral presentation. Assume attendees have already read the abstract so the focus can be on the key points and not rehashing minor details.²⁸ Poster presentations should address the motivation for the study, main findings, implications for practice, and future directions or next steps.^{13,20} It is often helpful to end with the take-home message from the work. Avoid providing detailed descriptions of methods as this can be viewed on the poster.

Abstract presentations are generally allocated more time for oral presentation, usually around 10–15 min. The additional time affords the opportunity to provide further details but should still focus on the main points. Posters may or may not be displayed during oral presentation. In some cases, slides are substituted for posters, which also offers visual representation of the research. For presentation of abstracts that include slides, consider using no more than 10 slides.

Make every effort to stay within the allotted time for presentation to allow time for questions afterward.²⁸ Otherwise, the moderator will politely encourage the presenter to finish so all presenters have the same opportunity and not exceed the scheduled time for the session. If there are a lot of questions and discussion, the moderator may conclude the presentation and suggest attendees talk with the presenter after the session. The moderator may also ask a question, possibly the same posed during poster viewing, so remember what was asked at that time and be prepared to answer again but this time at the podium for all session attendees.

Questions are to be expected not only regarding the work but also about the broader implications.¹⁴ Clinicians need to be familiar with the poster or slide content, literature on the topic, and related work to prepare for responding to questions and engaging in discussion.^{6,13} Anticipating questions that might be received can be helpful in preparing a response.¹⁴ Several months may have lapsed between abstract acceptance, creating the poster, and the date of the meeting, and new projects may already be underway; therefore, it will be important to stay refreshed on the study without having to relearn all the details when preparing for presentation.²⁸

Practicing the presentation is the best way to prepare, receive feedback from colleagues or peers, and gain an understanding of the type of questions that may be posed from individuals not involved in the research.⁹ Consider preparing a script to use as guide to ensure the main points are covered. The respiratory care department at this author's institution hosts an annual research forum that helps clinicians prepare for presentation at the Open Forum. This provides the opportunity to practice in front of peers and to receive feedback to improve the presentation. After conclusion of the scientific meeting, consider displaying the poster in the department or other area within the institution to share the work with others.^{24,27}

Summary

Posters provide an illustrated display of research findings. Requirements for poster presentations vary among different scientific meetings, and it is important to follow instructions set forth by the specific conference. Poster design is crucial for creating a poster that has visual appeal and attracts the attention of meeting attendees. There are different types of poster and abstract sessions, and formats may vary by meeting. Regardless of the type of session, preparation is vital for a positive outcome and experience. Practicing the presentation, anticipating questions, and being familiar with the content are equally important as creating the poster or slides. A visually aesthetic poster and efficiently delivered take-home message are the main keys to a successful poster session.

REFERENCES

1. Miller AG. How to write an abstract for presentation at a scientific meeting. *Respir Care* 2023;68(11):1569-1575.
2. Hess DR. Research and publication in respiratory care. *Respir Care* 2023;68(8):1171-1173.
3. Willis LD. Formulating the research question and framing the hypothesis. *Respir Care* 2023;68(8):1180-1185.
4. Miller AG. Getting started in research: the role of mentorship, forming the team, and developing a process. *Respir Care* 2023;68(8):1174-1179.
5. Rowe N, Ilic D. What impact do posters have on academic knowledge transfer? A pilot survey on author attitudes and experiences. *BMC Med Educ* 2009;9:71.
6. Rowe N, Ilic D. Poster presentation - a visual medium for academic and scientific meetings. *Paediatr Respir Rev* 2011;12(3):208-213.
7. Edwards DJ. Dissemination of research results: on the path to practice change. *Can J Hosp Pharm* 2015;68(6):465-469.
8. Willis LD, Rintz J, Zaccagnini M, Miller AG, Li J. Barriers to respiratory care research in the United States. *Respir Care* 2023;68(8):1112-1118.
9. Wood GJ, Morrison RS. Writing abstracts and developing posters for national meetings. *J Palliat Med* 2011;14(3):353-359.
10. Siedlecki SL. Original research: how to create a poster that attracts an audience. *Am J Nurs* 2017;117(3):48-54.
11. Hess GR, Tosney KW, Liegel LH. Creating effective poster presentations: AMEE Guide no. 40. *Med Teach* 2009;31(4):319-321.
12. Taggart HM, Arslanian C. Creating an effective poster presentation. *Orthop Nurs* 2000;19(3):47-49, 52.
13. Berg J, Hicks R. Successful design and delivery of a professional poster. *J Am Assoc Nurse Pract* 2017;29(8):461-469.
14. Gemayel R. How to design an outstanding poster. *FEBS J* 2018;285(7):1180-1184.
15. Gopal A, Redman M, Cox D, Foreman D, Elsey E, Fleming S. Academic poster design at a national conference: a need for standardized guidance? *Clin Teach* 2017;14(5):360-364.
16. International Committee of Medical Journal Editors. Recommendations for the conduct, reporting, editing, and publication of scholarly work in medical journals. Updated May 2023. Available at: <https://www.icmje.org/recommendations>.
17. Stankovic N, Nolan JP, Andersen LW. Reporting of academic degrees in high-impact medical journals. *F1000Res* 2019;8:1852.
18. National Board for Respiratory Care. Use of credentials: how to properly use your NBRC credential(s). Available at: <https://www.nbrc.org/wp-content/uploads/2018/05/Use-of-Credentials-Website.pdf>.
19. Gundogan B, Koshy K, Kurar L, Whitehurst K. How to make an academic poster. *Ann Med Surg (Lond)* 2016;11:69-71.
20. Papanas N, Georgiadis GS, Demetriou M, Lazarides MK, Maltezos E. Creating a successful poster: "Beauty Is Truth, Truth Beauty." *Int J Low Extrem Wounds* 2019;18(1):6-9.
21. Shellely DC. How to make an effective poster. *Respir Care* 2004;49(10):1213-1216.
22. Ferreira JC, Patino CM. How to prepare and present a poster at a conference and communicate your research findings effectively. *J Bras Pneumol* 2019;45(3):e20190167.
23. Persky AM. Scientific posters: a plea from a conference attendee. *Am J Pharm Educ* 2016;80(10):162.
24. Barker E, Phillips V. Creating conference posters: structure, form, and content. *J Perioper Pract* 2021;31(7-8):296-299.
25. Erren TC, Bourne PE. Ten simple rules for a good poster presentation. *PLoS Comput Biol* 2007;3(5):e102.
26. Boullata JI, Mancuso CE. A "how-to" guide in preparing abstracts and poster presentations. *Nutr Clin Pract* 2007;22(6):641-646.
27. Beamish AJ, Ansell J, Foster JJ, Foster KA, Egan RJ. Poster exhibitions at conferences: are we doing it properly? *J Surg Educ* 2015;72(2):278-282.
28. Campbell RS. How to present, summarize, and defend your poster at the meeting. *Respir Care* 2004;49(10):1217-1221.