Emergency Department Operations Dictionary: Results of the Second Performance Measures and Benchmarking Summit

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Abstract

The public, payers, hospitals, and Centers for Medicare and Medicaid Services (CMS) are demanding that emergency departments (EDs) measure and improve performance, but this cannot be done unless we define the terms used in ED operations. On February 24, 2010, 32 stakeholders from 13 professional organizations met in Salt Lake City, Utah, to standardize ED operations metrics and definitions, which are presented in this consensus paper. Emergency medicine (EM) experts attending the Second Performance Measures and Benchmarking Summit reviewed, expanded, and updated key definitions for ED operations. Prior to the meeting, participants were provided with the definitions created at the first summit in 2006 and relevant documents from other organizations and asked to identify gaps and limitations in the original work. Those responses were used to devise a plan to revise and update the definitions. At the summit, attendees discussed and debated key terminology, and workgroups were created to draft a more comprehensive document. These results have been crafted into two reference documents, one for metrics and the operations dictionary presented here. The ED Operations Dictionary defines ED spaces, processes, patient populations, and new ED roles. Common definitions of key terms will improve the ability to compare ED operations research and practice and provide a common language for frontline practitioners, managers, and researchers.

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Regulatory burdens, emergency department (ED) operations management, and research require emergency medicine (EM) experts to improve the timeliness and efficiency of emergency care. Patient flow standards and performance measurements are increasingly required by regulatory bodies like the Centers for Medicare and Medicaid Services (CMS) and the Joint Commission,[1–4] compelling us to use a precise and standardized vocabulary in defining, measuring, communicating, and reporting ED operations. If EM does not craft the language necessary to communicate the work we do, no doubt regulators will.

Emergency departments of varying sizes, characteristics, and locations around the country are testing techniques to improve ED efficiency, quality, safety, and cost.[5–9] Mary Washington Hospital in Fredericksburg, Virginia, for example, has implemented an intake model that involves a ''pivot nurse'' and ''patient segmenta-

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A list of The Second Performance Measures and Benchmarking Summit attendees is available in Table 1. (Listing does not imply endorsement of this document, but shows the diversity of representation at the summit.)

Information on the Emergency Department Benchmarking Alliance can be found at EDBenchmarking.org.

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tion'' that have demonstrated improved efficiency and patient and staff satisfaction.[10] Dissemination of these new ideas will be limited without the language to communicate them, with other EDs less likely to benefit from their innovation without a common definition of ''pivot nurse'' or ''patient segmentation.''

Standardized terminology and methodology are necessary if research in ED operations and quality improvement is to advance,[11–13] and it is fundamental that these terms be developed by stakeholders who understand the nuances of ED operations.

Participants in the Second Performance Measures and Benchmarking Summit were asked: 1) to discuss, debate, and revise a set of definitions pertaining to basic ED operations; 2) to maintain consistency with the recognized work already done in this area; 3) to define terms clearly so they may be applied uniformly in various ED settings; and 4) to build and standardize the terminology of EM operations. Participants also developed metrics and measurements that will be published separately,[14] but this work defines space, processes, patient populations, and new staff roles.

EMERGENCY DEPARTMENT BENCHMARKING SUMMIT

The ED Benchmarking Alliance (EDBA) is a nonprofit collaborative of 367 performance-driven EDs. Founded in 1997, it is composed of EDs representing 14 million annual ED visits. The EDBA operates as a think tank, quality improvement collaborative, and learning community and shares its performance data and operational strategies so member hospitals may identify best practices. The alliance has developed a benchmarking database and educational programs focusing on ED operations and performance. It disseminates new ideas and innovations through conferences and publications.[15–22] Its first set of ED operations and performance definitions, published in 2006, is widely referenced.[23] The work done in 2010 builds on this earlier document. The entire project was deemed exempt from review by the Intermountain Healthcare Institutional Research Board (RMS Number 1021398).

After the EDBA board of directors (BOD) identified organizations with expertise in performance measurement, benchmarking, and ED operations, invitations were e-mailed to 32 of them requesting participation by an experienced representative (Table 1). Possible attendees were vetted by the BOD for expertise or experience on technical expert panels, national committees, and task forces and in research. Requests to substitute less-experienced persons or to bring interns were denied. Participants from the first summit also were invited, not only because of their experience in the field, but because of expertise in consensus building, developing summary documents, and publishing and disseminating the first document. The final roster of attendees had associations with the organizations shown in Table 2.

Table 1
Participants in the Second Performance Measures and Benchmarking Summit, Salt Lake City, February 24, 2010

- Sherri Almeida, RN, Emergency Nurses Association
- Brent Asplin, MD, MPH, Chair, Emergency Medicine, Mayo Clinic
- James Augustine, MD, Director, Clinical Operations, Emergency Medicine Physicians (EMP)
- Kevin Baumlin, MD, Informatics, Mt. Sinai Medical Center
- Jody Crane, MD, MBA, Institute for Healthcare Improvement (IHI)
- Steven Davidson, MD, MBA, Chair, Emergency Medicine, Maimonides Medical Center
- Angela Franklin, Esq., Director, Quality and Health IT, American College of Emergency Physicians (ACEP)
- David Garvey, MD, Physician Executive, The T-System
- Azita Hamedani, MD, University of Wisconsin, Madison
- Michael Handrigan, MD, Center for Emergency Preparedness, Health & Human Services (HHS)
- Bruce Janiak, MD, Vice Chair, Emergency Medicine, Medical College of Georgia
- Ian Jones, MD, Director, Medical ED, Vanderbilt University
- Nick Jouriles, MD, Past President, ACEP
- John Lyman, MD, CMO, Premier Health Care Services, Inc.
- Mark McClelland, MN, RN, GWU-The Center for Health Care Quality
- Jeanne McGrayne, RN, Premier Consulting Services
- Michael Phelan, MD, Emergency Medicine Quality Review Officer, Cleveland Clinic
- Randy Pilgrim, MD, President, EDPMA; Vice President, Operations, The Schumacher Group
- Charles Reese, MD, Chair, EDBA
- Deb Richey, RN, Board Member, EDBA
- Jedd Roe, MD, MBA, Chair, Emergency Medicine, William Beaumont Medical Center
- Andrew Roszak, Center for Emergency Preparedness, HHS
- Lucy Savitz, PhD, MBA, Intermountain Institute for Health Care Delivery Research
- Jeremiah Schuur, MD, Director, ED Quality and Safety, Brigham and Women's Hospital
- Tim Seay, MD, Greater Houston Emergency Physicians
- Suzanne Stone-Griffith, RN, Vice President, HCA Healthcare
- Todd Taylor, MD, Physician Executive, Microsoft Corp.
- Pamela Turner, RN, MBA, Rudder Associates Consulting
- Ellen Weber, MD, Emergency Medicine, University of California-San Francisco
- Shari Welch, MD, Fellow, Intermountain Institute for Health Care Delivery Research
- Jennifer Wiler, MD, MBA, University of Colorado

EDBA = Emergency Department Benchmarking Alliance.

SUMMIT WORKING MODEL

Prior to the summit, the EDBA circulated a survey asking participants to comment on the limitations and omissions of the 2006 document and used those comments to form the summit agenda. Summit organizers selected workgroup leaders based on their knowledge and leadership experience, crafted a project plan, and formed workgroups. Each workgroup also was assigned a member of the BOD who had been through the process before to provide oversight and keep the workgroup on task.

Each workgroup leader received instructional materials about running a successful workgroup and copies of the project's objectives, work plan, and timetable. Workgroup members also received the 2006 document and other relevant papers and documents. Information sharing took place via the Internet, e-mails, and conference calls, and EDBA provided project support in the form of a conference call line, assistance with document processing, and project coordination. Two authors (SW

Table 2
Professional Associations of Summit Attendees

- Agency for Healthcare Research and Quality
- American Academy of Emergency Medicine
- American College of Emergency Physicians
- American College of Health Care Executives
- Emergency Care Coordination Center, US Department of Health & Human Services
- EDBA
- Emergency Department Practice Management Association
- Emergency Nurses Association
- Institute for Healthcare Improvement
- Intermountain Institute for Health Care Delivery Research
- Joint Commission
- National Quality Forum
- Society for Academic Emergency Medicine

*Listing does not imply endorsement of this document, but shows the diversity of representation at the summit.
EDBA = Emergency Department Benchmarking Alliance.

and JS) integrated each workgroup's summary section into a final manuscript. The composite document was circulated numerous times to the workgroup leaders and EDBA leadership for editing. Areas of disagreement were addressed through conference calls and threaded e-mail discussions until consensus was reached. The EDBA used this methodology successfully during the first summit and in a conference on ED intake. This dictionary is organized as follows: 1) space definitions, 2) process definitions, 3) patient populations, and 4) staff roles.

SPACE DEFINITIONS

Many EDs have created new areas for specific patients and tasks:

- **Emergency Department (ED):** A 24-hour location serving an unscheduled patient population with anticipated needs for emergency medical care, receiving emergency medical services (EMS) transports.
- **Psychiatric ED:** An ED developed and promoted to the community as serving the unscheduled needs of patients with mental health conditions.
- **Pediatric ED:** An ED designed and dedicated to serve the needs of pediatric patients, defined as patients younger than 18 years of age.
- **Triage Area:** The space where traditional triage assessment (e.g., history, cursory physical exam, and vital signs) takes place.
- **Intake Area:** The space where initial clinical assessment occurs, by whatever model, that allows for sorting and appropriate placement into a treatment space, treatment room, or waiting area. In many newer intake models, labs are drawn and intravenous lines may be started in the intake area.
- **ED Treatment Room:** An area in which complete health services can be delivered to the patient (does not include hallways, parking spaces, and holding areas).
- **ED Treatment Space:** An area where limited health services can be delivered. It may not be suitable for complete health service, and may include hallways or group treatment areas.
- **Fast Track:** Dedicated space within the ED or adjacent to it dedicated to treatment for minor illnesses, wounds, and injuries. Patients treated here should ideally have throughputs of 90 minutes or less.
- **Clinical Decision Unit:** Space within or adjacent to the ED with multiple treatment spaces designed for ED patients undergoing lengthy and more detailed workups with expected occupancies of 6 to 8 hours.
- **Observation Unit:** Space designed for patients needing a period of observation not intended to exceed 24 hours. These may be adjacent to or remote from the ED, or they can be virtual units.
- **Results Waiting Area:** Space where vertical patients (patients arriving ambulatory and whose conditions do not warrant a supine position and bed placement) await test results after the initial medical evaluation is complete. It may be a part of the traditional waiting room or space within the ED where patients are seated, not on stretchers.
- **Discharge Waiting Area:** Space allocated for ED patients awaiting discharge (the process and paperwork) who no longer need diagnostic or therapeutic interventions.
- **Discharge Kiosk:** Specified area, usually adjacent to ED, where patients go through the discharge process including receiving instructions and prescriptions. Copayments may be made here.
- **Express Admission Unit:** Designated space, often within or adjacent to the ED, for ED patients awaiting inpatient bed placement. Often admission processing takes place here. The diagnostic and therapeutic needs of the patients at this stage no longer require an ED treatment room, opening up ED beds and facilitating flow.

PROCESS DEFINITIONS

New processes for core ED operations are constantly evolving to improve ED patient flow and current practices, and these were refined during the second summit.

- **EMS Offloading:** The process of transferring a patient from an EMS stretcher and placing him or her in a treatment space. Care is assumed by the ED staff.
- **Identification:** The process of collecting sufficient information critical to establishing and recording a unique patient encounter with at least two unique identifiers. This is distinct from registration.
- **Triage:** The process of assessing patients who present for care by prioritizing access to providers and space according to the urgency of the patient's need and the complexity of the services required. Traditionally performed by a registered nurse, it involves a number of steps and information-gathering. One of the most important features is the assignment of triage scale, now most frequently a five-level scale, either the Emergency Severity Index (ESI)[24] or the Canadian Triage Acuity Scale (CTAS).[25]
- **Intake:** The process of receiving and sorting persons seeking access to acute episodic medical care in the

ED. Models include triage, rapid medical screening, team triage, and physician in triage.[26]
- **Registration:** The process of identifying and recording information to generate a patient-specific record. It includes collecting information on financial responsibility and sociodemographic statistics for billing. Registration is distinct from patient identification.
- **Medical Screening Exam:** The assessment by a provider to determine if an emergent medical condition exists.
- **Discharge:** The process of releasing patients from the ED at the end of the encounter, including the distribution of discharge papers.
- **ED Diversion:** A notification to the medical community of a temporary limit of complete or partial institutional capability to handle medical or surgical conditions, communicated to EMS.
- **Boarding:** The practice of holding patients who have been admitted to the hospital in the ED for prolonged periods. Defined as a time interval, it encompasses the admit decision time to the departure time.
- **Overcapacity:** The condition of having more patients than treatment spaces in the ED. It may be measured as the time within a 24-hour period spent at overcapacity.
- **Patient Segmentation:** The practice of grouping patients who require similar services and have similar anticipated lengths of stay together in a geographic space in the ED, such as placing patients in a fast track or a clinical decision unit (also called patient streaming).

PATIENT POPULATIONS

To understand demand, EDs must track patient populations, and this process is aided by standardized definitions. All volumes are tracked as the number of cases per 100 ED visits.

- **Acuity by ESI/CTAS:** Patients given an ESI code of 1 or 2 on arrival are high-acuity and an ESI scale of 4 and 5 are low-acuity.
- **Acuity by Evaluation and Management (E/M Codes):** Patients given E/M codes of level 4 or 5 are high-acuity and of E/M level 1 or 2 are low-acuity.
- **Admission Rate:** Percentage of ED visits admitted to an inpatient unit.
- **Transfer Rate:** Percentage of ED visits transferred for care to another facility.
- **ICU Admission Rate:** Percentage of ED visits requiring an intensive care unit bed on admission.
- **Pediatric Volume:** ED visits under age 18 years.
- **Infant Pediatric Volume:** ED visits under age 2 years.
- **Geriatric Volume:** ED visits age 65 years or older.
- **Follow-up Volume:** ED visits instructed to return to the ED for further diagnostic or therapeutic interventions after a specific time interval.
- **Acute Myocardial Infarction (AMI) Volume:** ED visits with discharge diagnosis of AMI.
- **Stroke Patient Volume:** ED visits with discharge diagnosis of acute stroke.
- **Community-Acquired Pneumonia (CAP) Volume:** ED visits with a discharge diagnosis of CAP.
- **Congestive Heart Failure (CHF) Volume:** ED visits with a discharge diagnosis of CHF.
- **Emergency Surgery Volume:** ED visits going directly to the operating room from the ED.
- **Behavioral Health Volume:** ED visits seeking care for mental illness or substance abuse.
- **Sexual Assault Volume:** ED visits seeking care for sexual assault.

NEW ED ROLES

As part of ED operational improvements, new members have been added to the ED team.

- **Bed Czar:** Person assigned and empowered to find and allocate inpatient beds for admitted patients from the ED. Some places refer to this person as a Hospital Patient Flow Coordinator (this should not be confused with the ED Patient Flow Coordinator).
- **Call-back Physician or Nurse:** A health care worker assigned to contact patients after an ED visit to inquire about the quality of the ED experience and the patient's condition and to communicate any results unavailable during the visit.
- **Case Manager:** A health care worker, typically a nurse or social worker, with training in case management. Duties may include reviewing cases for inpatient admission; facilitating bed placement; ensuring appropriate ED use; and arranging home care, follow-up care, transport, and nursing home care.
- **Crisis Worker:** A licensed social worker with psychiatric experience who may be stationed within or on call to the ED to assist in evaluating and making the disposition for patients presenting with behavioral health issues.
- **Discharge Team:** A team of health care workers, typically a nurse and a technician, dedicated to the discharge process. The goals of the discharge team are to expedite patient discharge and improve efficiency in ED treatment room throughput.
- **ED Coordinator, also Called Patient Flow Coordinator (PFC):** The PFC oversees discharges, admissions, and overall patient flow. Typically a nurse, the coordinator also monitors the ED for process defects, bottlenecks, waits, and delays.
- **ED Lab Tech:** A technician stationed in the ED with responsibility for collecting, labeling, and transporting specimens to the lab. Also collects results and presents them to the clinical staff. This person may be hired jointly by the ED and the laboratory.
- **Greeter:** A nonlicensed individual stationed in the ED waiting area who provides information, comfort services, and escort services for patients and their families. This is usually a volunteer position.
- **Health Unit Clerk (HUC):** Formerly called the ED secretary, the clerk is responsible for answering telephones, entering physician orders into the computer, calling consulting physicians, maintaining charts, and other clerical tasks as assigned.
- **Physician's Assistant and Liaison (PAL):** This individual functions at the interface between the provider

and information technology (IT). He or she documents and tracks patient test results and provides these data to the provider. The PAL is a scribe and personal patient flow coordinator for the provider.

- **Pharmacist:** Licensed professional responsible for providing comprehensive clinical pharmacy services including therapeutic consultation and formulation.
- **Physician Assistant (PA):** A licensed provider practicing medicine under the supervision of physicians and surgeons. PAs are formally trained to provide diagnostic, therapeutic, and preventive health care services, as delegated by a physician.
- **Pivot Nurse/Podium Nurse:** A nurse, typically with extra training and experience, who rapidly assesses patients and assigns them to a patient stream for care. This typically takes less than 2 minutes.
- **Scribe:** The scribe assists the ED provider by documenting the patient assessment and treatment plan in the medical record. Scribes often facilitate patient flow by following up on diagnostic study results, implementing the treatment plan, and assisting with consults and other care processes. Scribes are generally assigned to one physician per shift and often are students in health care programs.
- **Transport Technician:** This worker transports patients around the ED and to other departments for testing and treatment.
- **Valet:** The valet is stationed at the entrance of the ED, and physically assists fragile incoming and discharged patients to and from private vehicles. The valet will direct family members on parking, entry, and intake procedures. This is not to be confused with valet services outside of health care, whose function is to park cars.

Much has changed since the 2006 ED operational performance document was published.

CHANGING PARADIGMS

New ED intake models, growing evidence that ED crowding and prolonged length of stay are associated with lower quality care and worse outcomes, and an intense national focus on the measurement of health care quality has brought changes to the emergency care landscape.[26–33] As the field of ED operations management grows and accumulates a body of knowledge, the need for precise and standardized terminology will become even more critical. To that end, the EDBA organized this summit to review and update critical terminology.

This article differs from the 2006 article in a number of areas that deserve mention. The first paper suggested a comparison scheme for benchmarking that did not prove useful or survive validity testing. It has been removed, and this paper refines patient population definitions against which EDs can benchmark themselves. This dictionary also provides a more exhaustive list to help EDs characterize and track demand. By understanding the patient populations an ED serves, leaders and managers can predict the services that will be needed. The first consensus paper predominantly focused on measures and metrics with some relevant terms defined. This more comprehensive document functions as an operations dictionary encompassing the main elements of ED operations: space, processes, patients, and staff.

Summit attendees also removed terms that did not gain acceptance or that were criticized as ambiguous, including ''conversion time'' and ''ED boarding load.'' The definitions have been edited, revised, and vetted by the stakeholders, aligned with definitions from the Emergency Nurses Association, CMS, and the National Quality Forum.

LIMITATIONS

This work has two inherent limitations. First, recognized qualitative research consensus methodologies like the Delphi method, which have been used before in this type of work, were not employed.[34] The methodology employed, however, has been used successfully by EDBA in the past to develop consensus around particular issues in EM, and it has its own rigor.[35] Summit organizers incorporated strategies used in similar EDBA work including surveys, meetings, conference calls, e-mail, and iterative processes. Second, the creation of the group was open to selection bias, although representation from leading organizations in EM was solicited, and the document was reconciled with work done by other prominent stakeholders. This dictionary is the result of a complex process to achieve consensus and represents the collected views of informed individuals.

CONCLUSIONS

The need to define, standardize, and quantify the metrics, definitions, and data used in our industry has never been more compelling. In response to the growing demand for measures of ED performance, we convened a summit of key stakeholders. Using an iterative team process, a dictionary for ED operations was developed by consensus. We present definitions for ED spaces, processes, patient populations, and new staff roles. These standardized definitions should help ED administrators, researchers, and regulators by providing a common language with which to communicate.

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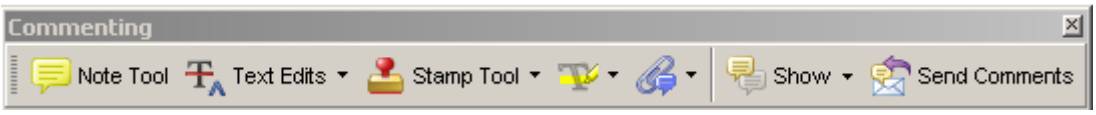

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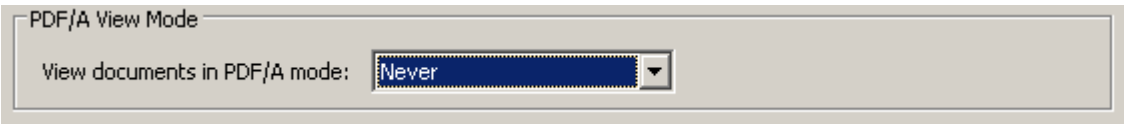

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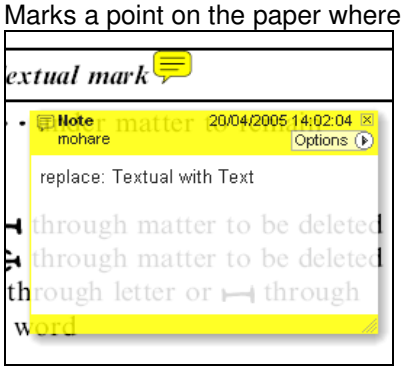

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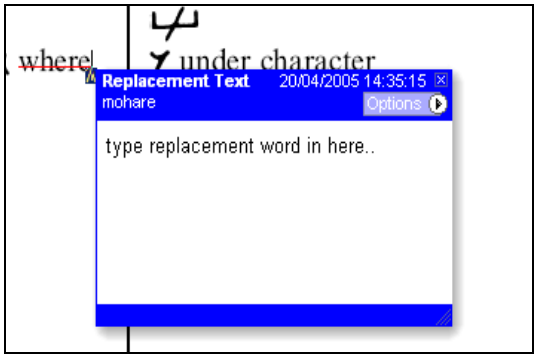
Replacement text tool — For deleting one word/section of text and replacing it

Strikes red line through text and opens up a replacement text box.

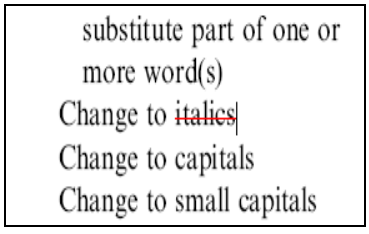


How to use it:

1. Select cursor from toolbar
2. Highlight word or sentence
3. Right click
4. Select Replace Text (Comment) option
5. Type replacement text in blue box
6. Click outside of the blue box to close

Cross out text tool — For deleting text when there is nothing to replace selection

Strikes through text in a red line.



How to use it:

1. Select cursor from toolbar
2. Highlight word or sentence
3. Right click
4. Select Cross Out Text

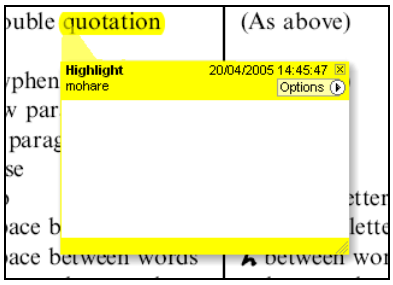
Approved tool — For approving a proof and that no corrections at all are required.

How to use it:

1. Click on the Stamp Tool in the toolbar
2. Select the Approved rubber stamp from the 'standard business' selection
3. Click on the text where you want to rubber stamp to appear (usually first page)

Highlight tool — For highlighting selection that should be changed to bold or italic.

Highlights text in yellow and opens up a text box.

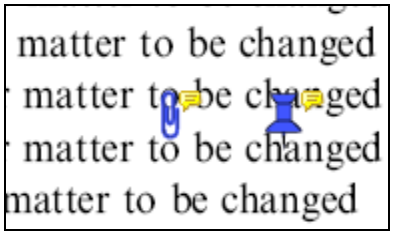


How to use it:

1. Select Highlighter Tool from the commenting toolbar
2. Highlight the desired text
3. Add a note detailing the required change

Attach File Tool — For inserting large amounts of text or replacement figures as a files.

Inserts symbol and speech bubble where a file has been inserted.

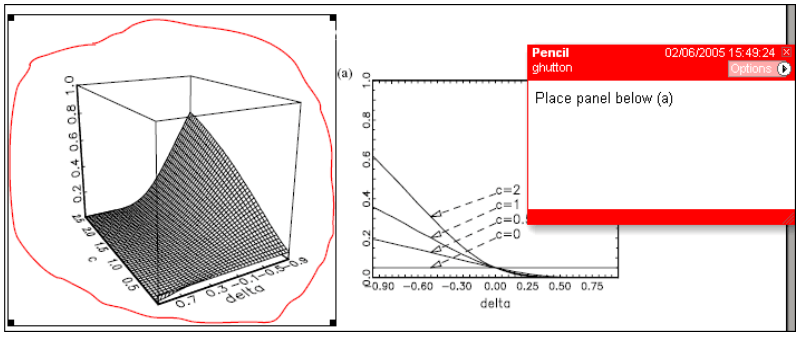


How to use it:

1. Click on paperclip icon in the commenting toolbar
2. Click where you want to insert the attachment
3. Select the saved file from your PC/network
4. Select appearance of icon (paperclip, graph, attachment or tag) and close

Pencil tool — For circling parts of figures or making freeform marks

Creates freeform shapes with a pencil tool. Particularly with graphics within the proof it may be useful to use the Drawing Markups toolbar. These tools allow you to draw circles, lines and comment on these marks.



How to use it:

1. Select Tools > Drawing Markups > Pencil Tool
2. Draw with the cursor
3. Multiple pieces of pencil annotation can be grouped together
4. Once finished, move the cursor over the shape until an arrowhead appears and right click
5. Select Open Pop-Up Note and type in a details of required change
6. Click the X in the top right hand corner of the note box to close.

Help

For further information on how to annotate proofs click on the Help button to activate a list of instructions: