ORIGINAL ARTICLE

An Audit of Inpatient Case Records and Suggestions for Improvements

A R Arshad, FRCS, S Ganesananthan, MRCP, S Ajik, MB, MS, Department of Plastic Surgery, Hospital Kuala Lumpur, Jalan Pahang, 50586 Kuala Lumpur

Summary

A study was carried out in Kuala Lumpur Hospital to review the adequacy of documentation of bio-data and clinical data including clinical examination, progress review, discharge process and doctor's identification in ten of our clinical departments. Twenty criteria were assessed in a retrospective manner to scrutinize the contents of medical notes and subsequently two prospective evaluations were conducted to see improvement in case notes documentation.

Deficiencies were revealed in all the criteria selected. However there was a statistically significant improvement in the eleven clinical data criteria in the subsequent two evaluations.

Illegibility of case note entries and an excessive usage of abbreviations were noted during this audit. All clinical departments and hospitals should carry out detailed studies into the contents of their medical notes.

Key Words: Documentation, Case notes, Criteria, Abbreviation

Introduction

Documentation in medical records is an important facet in continuous medical care. Documentation in medical records must be precise and adequate in content so as to enable the Clinician and other care providers to access salient information during day-to-day care of patients. It is vital that the clinician is concern about legibility and meticulous about clinical details and appropriate medical record keeping. Albeit being confidential, medical records have served as a traditional source of information for audits, quality assurance and clinical studies. With appropriate documentation, dilemmas about appropriateness of medical treatments, omission of care or neglect, adverse effects of surgery or pharmacological agents, unexpected complications and accepted complications of elective or semi-elective procedures will stand the test of any legal and ethical tussles[1,2,3].

Many guidelines for documentation in the medical records have been proposed for good clinical practice[4]. However the habit of documentation in medical records will stem back from medical school training and the policy in the respective department[2]. What should be the contents of a good medical record? This is a very difficult question to answer, as it is subject to personal bias, subjectivity and a lot of criticism. A study in the casualty ward of the Kuala Lumpur Hospital revealed unsatisfactory documentation with regards to self-identity and means of contact in the care of trauma patients involving multidisciplinary teams[5]. A hospital management meeting was organized by the Public Health Institute from 21st - 25th October 1996 at Port Dickson to look at ways and means to improve documentation of inpatient case records in Kuala Lumpur Hospital ("The PD Project Working Group"). Ten clinical departments consisting of general medicine,

general surgery, pediatric, obstetrics and gynecology and the various medical and surgical subspecialties were represented at this meeting.

The working group accepted that these basic criteria must be documented in our patient's case notes.

Bio-data - nine criteria

1. Name
2. Identity card number
3. Age/Date of Birth
4. Race/Nationality
5. Sex
6. Address/Telephone number
7. Next of kin
8. Date of Admission
9. Date of discharge

Clinical Data - eleven criteria

1. Chief complaints
2. History of present illness
3. Other relevant history
4. Physical examination
5. Provisional diagnosis/differential diagnosis
6. Investigations
7. Management
8. Progress review
9. Discharge/death
10. Summary
11. Doctor's identification

Materials and Methods

A retrospective study was performed from 1st September 1996 to 30th September 1996 to elucidate the adequacy of documentation in our inpatient case records from ten clinical departments in Kuala Lumpur Hospital. Thirty case notes randomly selected from the ward admission book from each of these clinical departments were audited and scored based on an agreed scoring system. Medical records consist of the patient's biodata completed by the admitting record officer and the clinical data documentation, which is entered by the attending clinicians. A simple scoring system was devised for the completeness of the patient's biodata and clinical data. The criteria scored are as shown on appendix I. One mark was given for a "YES" answer and a zero was given for a "NO" answer. All the data must be available in the subgroups before a "YES" is obtained. The maximum total score for the bio-data and clinical data was 9 and 11 respectively.

The committee felt that there could be further improvement in our hospital case documentation. In the second phase of the study (1st December 1996 to 31st December 1996), we prospectively looked at a further 30 case records from each of these departments. Only the heads of the respective clinical department or his appointed representative were privy to this study at this stage and were assigned to randonmly select the case records. The committee agreed that alternate case records were selected based on the ward admission book. All deficiencies in the documentation in case record were scrutinised and the staff of the various departments was informed. The senior staffs were advised to scrutinise the daily case documentation within their department.

A second prospective study utilizing similar number of inpatients medical records was conducted from 1st June till 30th June 1997 and scored based on similar criteria.

Statistical analysis

The ten clinical departments were labeled as Departments I to X to maintain their anonymity. The data obtained were analysed based on the agreed scoring system and tabulated as mean ± Standard deviation (Table I). The differences in the groups were analyzed with student's t-tests. Data from departments that were not as per protocol were not accepted and left as a blank. As the data obtained was considered relevant, they were maintained for analysis.

Results

Biodata scores are collected on admission. This in entered into the case records by the admitting officer in the casualty/admitting room or in some departmetns at the clinic during admission. There was no difference between the scoring at the three intervals except in department II where there was significant statistical deterioration in the June 97 score (Table I). Ideally all

the biodata listed should and must be obtained on admission but handling an ill patient requires consideration as resuscitation takes precedence. Vagabonds and some drug addicts were not able to produce their relevant biodata on admission. There was no significant difference in score if all ten departments were clumped as one for all three of the study periods.

The clinical departments varid in scores (Table I). There was significant difference in scores between the retrospective study performed in Septemeber 1996 and the prospective study performed in December 1996. However the two prospective studies in December 1996 and June 1997 were identical statistically except for VI that showed improvement ($p<0.05$). This implies that the existence of this Quality Assurance study has improved the scores tremendously without the remedial measures effected. This classifically demonstrates the Hawthorn effect seen in QA studies.

The authors decided to accept the retrospective study in September 1996 as the baseline and the prospective study in June 1997 as the representation of performance after the remedial actions has been carried out. Hence, seven departments show statistically significant improvement ($p<0.05$) and two departments maintained their score. The June 1997 data from department VII was not accepted as it was incomplete. The authors accept bias in data collection and scoring as different individuals performing this task were individuals with "vested interest" with a definite bias to protect their respective department.

Discussion

The major problems that have been identified in documentation of medical records were illegibility and insufficient entry of bio-data and clinical data. Deficiencies were revealed in all our criteria selected. There was also difficulty in identifying the doctors who entered the entries into the case notes. An excessive usage of abbreviations was noted during this audit. The time and date when all these entry were made were also sometimes not properly recorded. The objective of the group was therefore to find ways and means to achieve good medical record documentation by reeducating and reinforcing the habit of proper recording of relevant clinical data. In medical school, all medical students were taught how to systematically interview and do a physical examination on patients and then appropriately

Table I
Scores From Entry into Case-Notes

	BIO-DATA SCORE (max score: 9)			CLINICAL DATA SCORE (max score: 11)		
Department	**September 1996**	**December 1996**	**June 1997**	**September 1996**	**December 1996**	**June 1997**
I	7.5±1.1	7.8±1.0	8.5±1.1	6.9±1.8	9.5±1.1*	10.1±1.0**
II	8.5±0.6	8.6±0.6	8.1±0.7**	7.8±0.9	8.7±1.1*	9.9±1.0**
III	8.6±0.6	8.5±0.6	8.5±0.5	7.7±0.7	9.5±1.0*	10.0±1.0**
IV	8.9±0.4	9.0±0.2	8.8±0.4	10.3±0.7	10.9±0.2*	10.0±0.6**
V	8.6±0.7	8.1±1.0	8.4±0.3	9.2±1.2	9.4±1.2	10.8±0.5**
VI	9.0±0.0	8.2±0.6*	8.3±0.4	9.2±0.7	8.4±1.0*	9.9±0.6**
VII	-	-	-	8.6±1.4	8.7±1.4	-
VIII	-	-	-	8.8±1.1	9.4±0.9*	10.1±0.7**
IX	8.7±0.7	-	8.9± 0.6	10.6±0.6	-	10.8±0.7
X	8.8±0.7	-	8.9±0.6	10.9±0.7	-	10.8±0.6

* *p <0.05 compared with scores from September 1996*

** *p <0.05 compared with scores from September 1996*

document them. If these skills were adhered to at all times upon graduation, the problem of poor documentation will not arise.

The stakeholders on proper documentation of medical records range from those directly involved with patient care that includes doctors, nurses and paramedical staff, to those that are not directly involved with patient care that includes the patient themselves and their relatives, lawyers, police, insurance companies, mass media, researches, financial controllers and many others.

The process of documentation starts at the admission room or the front counter where our record office personnel first make the entry of the patient's bio-data. At the clinic, clerks, doctors and nurses enter bio-data and clinical data. In the ward, the ward clerks, doctors and nurses further enter various relevant information and "clerk" the case into the case notes. Any motivation or reinforcement that need to be given should be given to the above category of staff.

The usage of abbreviation in medical documentation has been a subject taken for granted. Problems would arise when these abbreviations could have different meanings to different people or could be interpreted as being meaningless to others. As the use of abbreviations cannot be completely eliminated, therefore a set of abbreviations that is applicable to majority of users is suggested and recommended (Appendix II).

Some of the problems could be eliminated if the workforce were increased. Shortage of manpower in certain departments fosters unacceptable usage of short cuts. Quality assurance should be taught as an integral subject in medical schools so those medical students are aware that medical documentation was under constant scrutiny. On going audits in documentation will certainly maintain the completeness and integrity of medical documentation. Computerization of medical records will eliminate eligibility, allow on-line networking with all departments within the hospital and certainly help in medical record archiving.

Conclusion

Documentation of medical records could be improved if all the medical staff, including doctors, nurses, paramedical staff and record officers concerned makes a serious effort. Ongoing audits certainly improve the process of documentation including obtaining the relevant bio-data. We accept that the usage of abbreviations cannot be totally eliminated, hence a set of common user abbreviations are suggested and recommended.

Acknowledgements

The authors would like to thank Dr Abdul Aziz Abdullah (Dept. of Psychiatry), Dr Raja Khuziah (Dept. of Paediatrics), Dr Ezlan Sidique (Dept. of Orthopaedic), Dr Harjit Singh (Dept. of Surgery), Dr Mohd. Rani Jusoh (Dept. of Neurology), Dr Rohna Ridzwan (Dept. of Dermatology), Dr Shahnaz Merican (Dept. of Neurology), Dr Suseela Muniandy (Dept. of Surgery), all from Hospital Kuala Lumpur, for their contributions in supplying relevent data.

Appendix I
Criteria Used for Assessment of Case Notes

Biodata	**Y**	**N**
1. Name	☐	☐
2. I/C	☐	☐
3. Age/Date of Birth	☐	☐
4. Sex	☐	☐
5. Race/Nationality	☐	☐
6. Address/Telephone	☐	☐
7. Next of Kin	☐	☐
8. Date of admission	☐	☐
9. Date of discharge	☐	☐

Clinical Data	**Y**	**N**	**Y**	**N**	**Y**	**N**
1. Complaint	☐	☐				
2. History of present illness	☐	☐				
3. Other history (Relevant)	☐	☐				
4. Physical examination	☐	☐				
a. General			☐	☐		
b. Vital signs			☐	☐		
- Pulse					☐	☐
- Blood pressure					☐	☐
- Tempreture					☐	☐
c. Systemic examination			☐	☐		
- Cardiovascular					☐	☐
- Respiratory					☐	☐
- Abdomen					☐	☐
- Central Nervous System					☐	☐
d. Specific/Local examination			☐	☐		

5. Provisional diagnosis
6. Investigation
7. Management
8. Progress review
9. a. Discharge
   i. Date
   ii. Final Diagnosis
   iii. Treatment
   iv. Follow up plan
   b. Death
   i. Date/Time
   ii. Cause of death
   iii. Certification
10. Summary
11. Doctor's Identification
   i. Clerking
   ii. Progress review
   iii. Discharge/Death

Appendix II
Recommended Common User Abbreviations

αFP	Alpha feto protein
Ab	Antibody
ABG	Arterial blood gas
ACE I	Angiotensin converting enzymes inhibitor
ACTH	Adenocorticotrophic hormone
AF	Atrial fibrillation
AFB	Acid Fast Bacilli
Ag	Antigen
AGN	Acute glomerulonephritis
AIDS	Acquired Immunodeficiency Syndrome
AIHA	Autoimmune Haemolytic Anaemia
ALL	Acute Lymphoblastic Leukemia
ALP	Alkaline phosphatase
ALT	Alanine aminotransferase
AML	Acute Myeloid Leukemia
ANA	Antinuclear antibody
Anti HIV	Anti Human Immunodeficiency Virus
APTT	Activated Partial Thromboplastin time
ARF	Acute renal failure
ASD	Atrial Septal Defect
AST	Aspartate aminotransferase
AXR	Abdominal radiograph
BD	Two times a day
BFMP	Blood film for Malaria parasite
BP	Blood pressure
BUSE	Blood urea serum electrolytes
C&S	Culture and sensitivity
CABG	Coronary Artery Bypass Graft
CAPD	Continuous ambulatory peritoneal dialysis
CBD	Continuous bladder drainage
CEA	Chorio-embryonic antigen
CK	Creatine kinase
CML	Chronic Myeloid Leukemia
CMV	Cytomegalovirus
CNS	Central Nervous System
COAD	Chronic obstructive airway disease

CREST	Calcinosis , Raynaud's phenomenon, oesophageal dysmotility, sclerodactyly, telangiectasia
CRF	Chronic renal failure
CRIB	Complete rest in bed
CSF	Cerebrospinal fluid
CT brain	Computer Tomographic Brain Scan
CVA	Cerebrovascular Accident
CVS	Cardiovascular System
CVVH	Continuous veno-venous haemoultrafiltration
CVVHD	Continuous veno-venous haemodialysis
CVVHDF	Continuous veno-venous haemodiafiltration
CXR	Chest X-Ray
Δ	Diagnosis
Δ Δ	Differential diagnosis
DIVC	Disseminated Intravascular Coagulation
DTPA	99m Tc-diethylenetriaminepenta-acetic acid
DVT	Deep Venous Thrombosis
ECG	Electrocardiogram
ECHO	Echocardiogram
EEG	Electroencephalogram
ELISA	Enzyme linked immunosorbent assay
EOD	Every other day
ERCP	Endoscopic retrograde cholangiopancreaticogram
ESR	Erytrocyte sedimentation rate
ESR	Erythrocyte sedimentation rate
ESRD	End stage renal failure
FBC	Full blood count
FBP	Full blood picture
FNAC	Fine needle aspiration cytology
FSL	Fasting serum lipid
G6PD	Glucose 6-phosphatase Deficiency
GCS	Glasgow Coma Scale
GXM	Group and crossmatch
HAV	Hepatitis A Virus
Hb	Haemoglobin
HBsAg	Hepatitis B surface antigen
HCV	Hepatitis C Virus
HDL-C	High density lipoprotein cholesterol
HIV	Human Immunodeficiency Virus
HPE	Histopathological Examination

I/O chart	Intake/output chart
ICP	Intracranial pressure
IDDM	Insulin Dependant Diabetes Mellitus
Ig	Immunoglobulin
IM	Intramuscular
INR	International normalised ratio
IV	Intravenous
IVP	Intravenous pylogram
JVP	Jugular venous pressure
KUB	Kidney Ureter Bladder
LDH	Lactate dehydrogenase
LDL-C	Low density lipoprotein cholesterol
LNRRTx	Living non-related renal transplantation
LP	Lumbar puncture
LRRTx	Living related renal transplantation
MRI	Magnetic Resonance Image Scan
MRSA	Methicillin Resistant Staphylococcus Aureus
NIDDM	Non Insulin Dependant Diabetes Mellitus
NSAIDs	Non-steroidal Anti-inflammatory Drugs
o.n.	On night
OGDS	Oesophagogastroduodenoscopy
PCR	Polymerase chain reaction
PDA	Patent Ductus Arteriosus
PRN	If necessary
PT	Prothrombin time
PTB	Pulmonary tuberculosis
PTCA	Percutaneous Transluminal Coronary Angioplasty
QID	Four times a day
RBS	Random blood sugar
RF	Rheumatoid factor
RIB	Rest in bed
RPR	Rapid Plasma Reagin Test
Rx	Therapy
S/C	Subcutaneous
SGOT	Serum gamma glutamyl transpeptidase
SIADH	Syndrome of Inappropriate Anti-Diuretic Hormone
SLE	Systemic Lupus Erythematous
SVT	Supraventricular tachycardia
T4	Thyroxin

Tab	Tablet
TB	Tuberculosis
TDS	Three times a day
TIBC	Total iron binding capacity
TOF	Tetralogy of Fallot
TSH	Thyroid stimulating hormone
U/S	Ultrasound
UFEME	Urine full examination and microscopic examination
UTI	Urinary tract infection
VBG	Venous blood gas
VDRL	Venereal Disease Reference Laboratory
VF	Ventricular fibrillation
VMA	Vanillylmandelic acid
VSD	Ventral Septal Defect
VT	Ventricular tachycardia

References

1. Iezzoni LI. The demand for documentation for Medicare payment. N Engl J Med, 1999; 341: 365-67.
2. Macleod J. Clinical Examination. 6th Edn. ELBS. 1983: 1-15.
3. Smith T, Moore EJH, Tunstall-Pedoe H. Review by a local medical research ethics committee of the conduct of approved research projects, by examination of patient's case notes, consent forms, and research records and by interview. BMJ, 1997; 314: 1588-93.
4. Twigg J, Briggs T, Parker C, Miller R. Notes: a suitable case for audit. Postgraduate Medical Journal,1993; 69: 578-80.
5. Chin PK, Lim BK *et al.* Adequacy of documentation for effective continuing care of patients with multidisciplinary trauma in the casualty ward. KLH: Journal of Quality Improvement, 1997; 1: 39-44.