# Benzodiazepine and Z-drug Prescribing for Elderly People in a General Hospital: A Complete Audit Cycle

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## Abstract

**Background:** Use of benzodiazepines and Z-drugs in the elderly is associated with adverse outcomes such as increased risk of falls and fractures and cognitive impairment. We aimed to assess the prescribing practice of benzodiazepine and Z-drugs in those aged over 65 years in a general hospital against evidence based standards and to examine the effects of multidisciplinary feedback, as well as determine the prevalence of usage.

**Methods:** All case-notes and medication charts of patients over the age of sixty five on surgical and medical wards in Sligo General Hospital (SGH) were retrieved and analysed over a two-day period in 2008. Data was collected in relation to benzodiazepine and Z-drug prescribing. We followed up on this initial data collection by screening discharge summaries at six weeks to assess benzodiazepine and Z-drug prescribing on discharge. Audit results were disseminated together with consensus guidelines on the prescribing of these medications in older adult population to all general practitioners in County Sligo. Educational sessions were held for both doctors and nurses in SGH. The audit cycle was completed by a re-audit of benzodiazepine and Z-drug prescribing six months from original study using identical methods.

**Results:** We found a high prevalence of benzodiazepine and Z-drug use in original audit, 54% (38/70) of the group audited. The prevalence fell to 46% (32/70) at the re-audit post intervention. This result was not statistically significant. The percentage of patients commenced on benzodiazepine and Z-drugs prior to admission fell from 36% (25/70) at the initial audit to 23% (16/70) at the re-audit.

**Conclusion:** Prescribing practices were not in keeping with consensus guidelines as highlighted by this relatively basic audit cycle. Multidisciplinary feedback and letters to GPs resulted in some reduction in the number of patients prescribed benzodiazepines and Z-drugs. Ongoing educational strategies aimed at relevant health care workers with regular audit of medication use within the general hospital setting is pertinent to further improve prescribing practice.


## Introduction

Benzodiazepines are among the most widely prescribed drugs for older persons and used for a multitude of conditions, most commonly insomnia, anxiety, and other psychiatric disorders.[1-4] Newer hypnotic drugs named Z-drugs are drugs which are also widely prescribed in the elderly population. Z-drugs are medications which have similar pharmacological action as benzodiazepines including side effects, benefits and risks but are structurally distant and unrelated to benzodiazepines on a chemical level. There are currently three major chemical classes of these drugs: 1) imidazopyridines, 2) pyrazolopyrimidines and 3) cyclopyrrolones. Z-drugs are so called because their names largely begin with the letter 'Z' e.g. zaleplon, zolpidem and zopiclone.

A large population-based study in Dublin found 17% of older people to be using Benzodiazepines[5] and a multicentre hospital-based study from Australia found 36% of the study population to be prescribed a benzodiazepine.[6]

Due to altered pharmacokinetics and pharmacodynamics with increasing age, elderly people are at increased risk of adverse events of benzodiazepines. These include falls, fractures, and cognitive impairment.[7-9] In a meta-analysis of benefits and risks of use of sedative hypnotics in older persons, the authors concluded that the risks of adverse events outweighed the benefits of improvement in sleep when sedative hypnotics were used.[9]

Numerous guidelines regarding benzodiazepine prescribing have been issued by major medical bodies from which we have formed our gold standard, including the Royal College of Psychiatrists,[10] National Institute for Clinical Excellence (NICE),[11] as well as the report of the benzodiazepine committee 2002, established by the department of health in Ireland.[12] These professional guidelines are based, in the main, on consensus views and advise that benzodiazepines and Z-drugs are only indicated for severe symptoms and, if prescribed, should be at the lowest effective dose and as a short-term therapy not exceeding four weeks.

Audit of all aspects of medication use is a recognised means of monitoring and improving the quality and safe use of medication.[13] Behaviour is unlikely to be altered via audit by itself, but information provided by audit will help guide educational


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**Table 1** Characteristics of study participants

| Characteristic | Baseline Audit | Re-Audit |
|---|---|---|
| Number of patients | 70 | 70 |
| % Female | 50 % | 69 % |
| Mean age | 77 (range 66-98 years). | 79 (range 65-92 years) |
| | | |
| **Reason for admission** | **Number (%)** | **Number (%)** |
| Falls and confusion | 11 (16) | 13 (18) |
| Fracture | 10 (14) | 0 (0) |
| Cardio-respiratory | 10 (14) | 7 (10) |
| Gastrointestinal | 9 (13) | 18 (26) |
| Other | 30 (43) | 32 (46) |

strategies to correct identified deficiencies in prescribing practice. The specific objectives of this audit were: (1) to compare benzodiazepine and z-drug prescribing practice against a gold standard and determine the prevalence of usage among elderly inpatients in a general hospital and (2) to examine the effect of multidisciplinary feedback and education on prescribing practices. We hypothesized that a reduction in the prevalence and practise of benzodiazepine and Z-drug prescribing would result from the feedback and educational intervention.

## Methods

The study was approved by the hospital's audit committee. Over a two-day period in October 2008, all adult inpatients aged over 65 on medical and surgical wards in a general hospital setting were identified. Data collections were carried out using case-notes and medication charts. Information on use of and prescribing practice of sedatives and hypnotics were retrieved by two authors (CD&DG) using a pre-set questionnaire compiled using standards set from professional medical body guidelines as mentioned in the introduction.

Information gathered included, total number of patients prescribed a benzodiazepine or a Z-drug and type and number of such drugs prescribed for the patient, whether it was prescribed since the admission or prior to admission, was an indication for prescribing documented, was a review date documented and was there a drug utilisation review by a pharmacy staff member.

Confidentiality was maintained of patients and prescribers with removal of identification by the auditors before data entry.

Discharge summaries of these patients were assessed, where available, at six weeks from the initial date of the study to audit discharge benzodiazepine and Z-drug prescribing. Discharge information gathered included whether patient was prescribed benzodiazepine or a Z-drug on discharge and whether their GP was informed of the indication for prescription.

The intervention consisted of sending feedback letters of the audit results together with consensus guidelines on benzodiazepine and Z-drug prescribing to all general practitioners in County Sligo. Moreover, two educational sessions, one for doctors and one for nurses, were held for general hospital staff.

Six months following the baseline audit, a point-prevalence study of Benzodiazepine and Z-drugs use in patients aged 65 and above was conducted in the same hospital with the identical methods as outlined above.

Data collected was analysed using SPSS 16.

## Results

Over the two-day period of the initial audit a total of 70 patient records were reviewed. Of this group 50% (35/70) were female. The mean age of this group was 77 years with a range of 66-98 years old.

There were 16% (n=11) of inpatients admitted for treatment of falls and confusion with 14% (n=10) admitted for treatment of fractures and 14% (n=10) for cardio respiratory problems, 13% (n=9) were admitted for gastrointestinal problems and 43% (n=30) were admitted for treatment of other medical issues.

At the time of re-audit (post intervention), once again 70 patient records were reviewed. On this occasion 69% (48/70) of the group were female.

The main reason for admission in 18% (n=13) of these inpatients was for treatment of falls and confusion, 10% (n=7) admitted with cardio respiratory problems, 26% (n=18) admitted with gastrointestinal problems and 46% (n=32) were admitted for treatment of other medical issues.

At the initial audit, 54% (38/70) of the total study sample were prescribed a benzodiazepine or a Z-drug. In total 61% (23/38) of this group were females and 39% (15/38) were male. Within this group 34% (13/38) were initiated on this medication while an inpatient in Sligo General Hospital and the remaining 66% (25/38) were initiated on same prior to admission. In this group prescribed benzodiazepine or Z-drug medication 15% (5/38) were prescribed more than one such medication.

An indication for prescribing benzodiazepines or Z-drugs was documented in only five percent (2/38) and a drug utilisation review by pharmacy department (as confirmed by pharmacy staff filling in allocated section of drug charts) was completed in only 55% (21/38) of cases.



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**Table 2** Differences in prescribing practices between baseline and re-audit

| Item | Baseline Audit | Re-Audit |
|---|---|---|
| Total number of patients on benzodiazepine and Z-drugs | 38/70 (54%) | 32/70 (46%) |
| % Female | 23/38 (61%) | 25/32 (78%) |
| % Male | 15/38 (39%) | 7/32 (22%) |
| Benzodiazepine and Z-drugs commenced during admission | 13/38 (34%) | 16/32 (50%) |
| Benzodiazepine and Z-drugs commenced prior to admission | 25/38 (66%) | 16/32 (50%) |
| Number of patients prescribed more than one benzodiazepine and Z-drug | 5/38 (15%) | 6/32(19%) |
| Indication for prescribing documented | 2/38 (5%) | 4/32 (12.5%) |
| Drug utilisation review by pharmacist | 21/38 (55%) | 8/32 (25%) |

**Table 3** Type of medication prescribed

| Medication | Baseline No (%) | Re-Audit No (%) |
|---|---|---|
| Lorazepam | 2 (4) | 4 (11) |
| Diazepam | 3 (7) | 2 (5) |
| Temazepam | 11 (25) | 6 (16) |
| Zopiclone | 16 (36) | 12 (32) |
| Midazolam | 3 (7) | 1 (3) |
| Zolpidem | 2 (5) | 2 (5) |
| Alprazolam | 4 (9) | 6 (16) |
| Other | 3 (7) | 4 (12) |

During the two day re-audit period the percentage of the study sample being prescribed a benzodiazepine or a Z-drug fell to 46% (32/70). This difference was not statistically significant. In total 78% (25/32) of this group were female and 22% (7/32) were male. In this group 50% (16/32) were initiated on this medication during their inpatient admission and the remaining 50% (16/32) were initiated on same prior to admission. Within the group prescribed benzodiazepine or Z-drug medication, 19% (6/32) were prescribed more than one such medication.

An indication for prescribing benzodiazepine or Z-drugs was documented in only 12.5% (4/32) and a drug utilisation review by pharmacy department was completed in only 25% (8/32) of cases.

Zopiclone, a Z-drug, was overall the most commonly prescribed hypnotic medication whilst Temazepam was the most common benzodiazepine prescribed. Table 3 shows breakdown of the types of medications prescribed.

In the initial audit, 47% (18/38) of the study participants who were prescribed a benzodiazepine or Z-drug were discharged on those medications. This compares to 63% (20/32) at the time of re-audit.

## Discussion

This study describes the completion of an audit cycle regarding benzodiazepine and Z-drug prescribing among elderly patients in a general hospital. Our study reported a high prevalence of benzodiazepine and Z-drug usage among the elderly inpatients both at baseline and at the re-audit. Our figures are twice those found by Kirby *et al*[5] and higher than those by Elliot *et al* from Australia.[6]

In the absence of documentation of the indication for usage, it is difficult to comment on the appropriateness of prescribing in our study sample. The low rate of documentation of 'Indication for Prescribing' is striking at only 2/38 (5%) before and 4/32 (12.5%) after intervention. This emphasises the particular importance of record-keeping and communication with regard to benzodiazepine and Z-drug prescribing. Improvement of prescribing practices in medical practice is a challenging undertaking as demonstrated by our findings suggesting that in-hospital prescribing practices were unaltered by our educational intervention.

This is in keeping with results from a large randomised controlled trial involving primary care physicians in Canada where a single educational intervention failed to make significant changes to benzodiazepine prescribing practices.[14] Jamtvedt *et al* in an extensive review also had similar conclusions that audit and feedback may be effective in improving professional medical practice, although effects are generally moderate.[15] This may indicate that more complex interventions involving different stakeholders are necessary to effect change in medication prescribing practices.

With regard to primary care physicians, local general practitioners were provided with feedback on initial audit results and given a copy of consensus guidelines via letter. As our figures show from the re-audit of prescribing practice, six months following the original study, with intervention as described above in the interim, 50% (16/32) of patients were prescribed these medications prior to admission, presumably in the primary care setting, compared to 66% (25/38) at baseline. This therefore shows a notable improvement in prescribing practice in the primary care setting following intervention. While these results were not statistically



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significant, it is likely dissemination of results of the initial audit plus educational material supplied on consensus guidelines is likely to have improved primary care prescribing practices.

The importance of continuing audit of the practice of benzodiazepine and Z-drug prescribing in the inpatient setting is also emphasised as a result of this study. Of patients prescribed a sedative or hypnotic 34% (13/38) were commenced on this medication during the course of the admission in the baseline audit compared to 50% (16/32) commenced on these medications during admission at re-audit. Also the increase in frequency of prescribing of sedative or hypnotic medication on discharge at time of re-audit being 63% (20/32) versus 47% (18/38) at baseline, highlights the need for development and implementation of local guidelines as well as regular education and training of healthcare professional. This is necessary as there is a particularly high staff turn-over of health care workers, particularly of NCHDs who are usually the most frequent sedative and hypnotic prescribers in the general hospital setting. Therefore those who may have been educated as part of our intervention may have not been the prescribing doctors whose practice we re-audited six months from baseline. Nursing staff on this occasion were also educated on correct prescribing practices in the hope of bringing to the attention of the prescribing doctor any deficiencies in prescribing practice. Further improvements might be achieved by establishing rolling programmes of education for relevant healthcare workers. The fact that a large percentage of patients were commenced on sedative or hypnotic medication in the inpatient setting may reflect the clinical difficulties of sleep disturbance associated with admission to hospital of the elderly population. Education on avoidance of 'knee-jerk prescribing' and non-pharmacological interventions would also be appropriate to possibly improve upon the findings of this audit.

This completed audit cycle has emphasised the importance of repeat audits, publication of results and regular feedback to relevant healthcare workers. This is essential to continue to monitor response to educational strategies, identify any deficiencies in prescribing practice and facilitate progressive modification of interventions designed to improve the quality of prescribing. We plan to introduce a brief educational component as part of non-consultant hospital doctor (NCHD) induction on a rolling basis to see if this influences prescribing practices. This audit cycle has also had a major influence on clinical practice within the Psychiatry of Old Age service. It has led to the modification of our Consultation Liaison assessment, to include a section on advice re benzodiazepine, hypnotic and psychotropic prescribing. It has also led to more active input to facilitate reduction and withdrawal from benzodiazepines whenever possible. There have been a number of very successful individual clinical outcomes, again highlighting the importance of audit.

## Conflict of interest

None.

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