Pharmacists' attitudes towards a pharmaceutical assessment screening tool to help prioritise pharmaceutical care in a UK hospital

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Pharmacists' attitudes towards a Pharmaceutical Assessment Screening Tool (PAST) to help prioritise pharmaceutical care in a UK hospital

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Key messages

What is already known:

- Pharmaceutical assessment screening tools are being developed and improved to help predict patient requirements for pharmaceutical care in hospitals and potentially reduce adverse drug events
- Pharmacists may be using the tools to prioritise their own work schedule rather the pharmaceutical care needs of a clinical team or an entire hospital

What this study adds:

- Pharmacists feel confident about using a pharmaceutical assessment screening tool to help them assign a patient acuity level and monitor patients' pharmaceutical needs whilst in hospital. However the use of professional judgement to assign an acuity level overrides any predicted level from the tool itself.

- Careful design of validated screening tools, with appropriate training on their use, is required if such tools are to be successfully utilised by pharmacy departments to target which patients need to be seen more frequently, and by an appropriately experienced clinical pharmacist, and ultimately fulfil their promise to prevent adverse drug events in hospital inpatients

Keywords

Hospital pharmacists, Quality Improvement, Pharmaceutical care, Patient Acuity, Assessment screening tools

Abstract

Objective

To establish the thoughts of pharmacists using the pharmaceutical assessment screening tool (PAST) when assigning a patient acuity level and establish other decision factors. A patient acuity level is a pharmaceutical assessment of a patient (lowest =1 to highest =3), higher patient acuity levels highlight the requirement for a more intensive pharmaceutical input to reduce potential harm.

Method

A questionnaire designed to elicit attitudes about the pharmaceutical assessment screening tool was circulated to 32 pharmacists working in a 900 bed UK university teaching hospital. Respondents were asked to document what patient acuity level they would assign for six theoretical patient cases with an explanation. The data collected was analysed using Microsoft Excel® and further analysis was undertaken about the strength of agreement to PAST using the kappa statistic (K) using Stata v12 (StataCorp, TX., USA).

Results

The questionnaire was completed by 28/32 pharmacists (87.5% response rate). The mean confidence (SD) for assigning a patient acuity level (PAL) was 81% (±20%). 26/28 pharmacists (93%) agreed or strongly agreed that professional judgement guided them most when allocating a PAL. The PAL assigned to the case studies presented both over and under estimations compared to the guidance but overall the strength of agreement was considered to be “fair” (K =0.202).

Conclusion

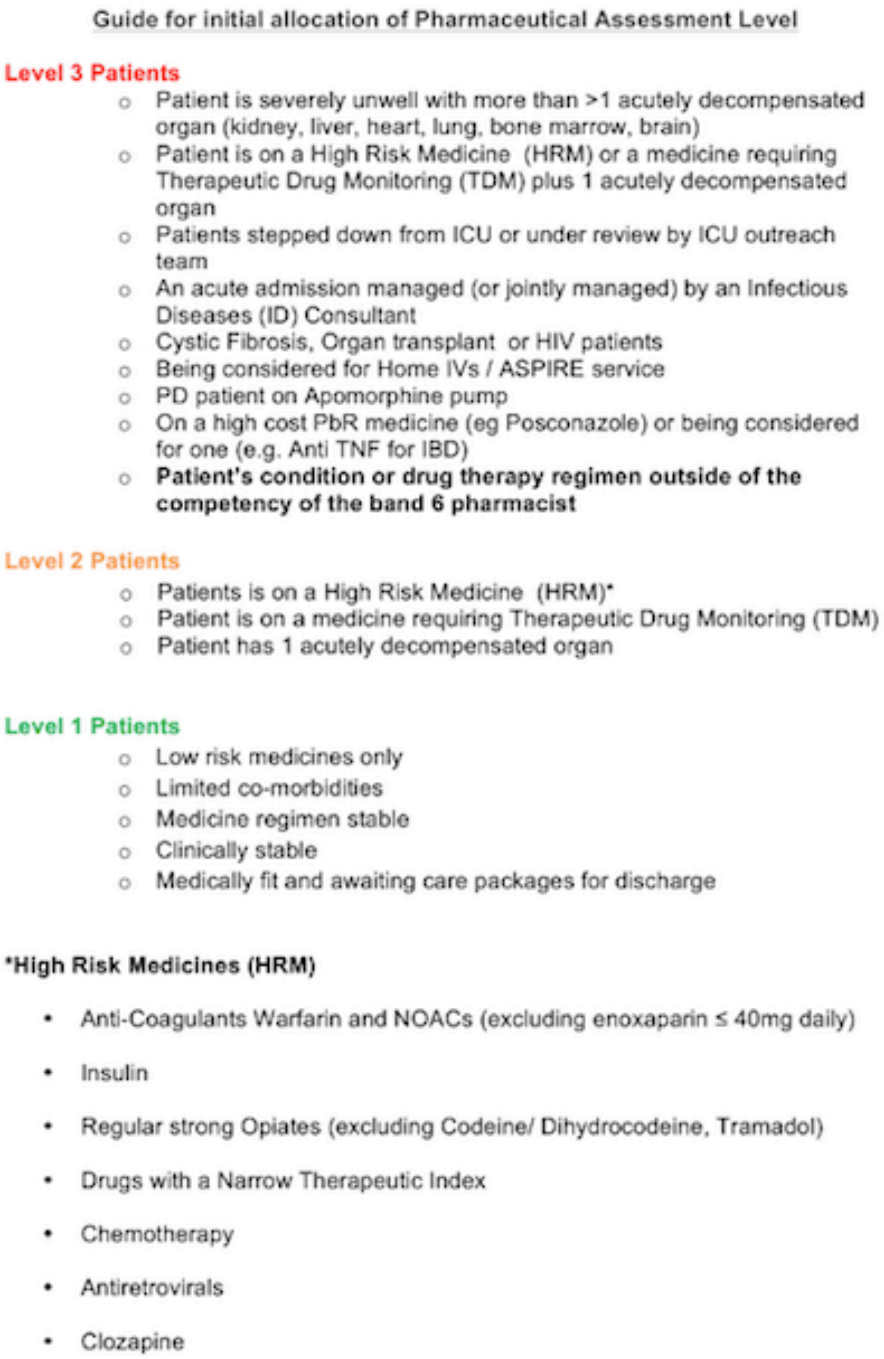
Pharmacists feel confident about using a pharmaceutical assessment screening tool to help them assign a patient acuity level. However the use of professional judgement to assign an acuity level overrides any predicted level from PAST.

Introduction

Assessment tools to help guide the levels of care and staffing required on hospital wards are in regular use for medical and nursing staff in UK hospitals[1,2]. Tools to help predict patient requirements for pharmaceutical care in hospitals are however poorly developed. A small number of pharmaceutical assessment screening tools (PAST) have been designed and introduced to prevent adverse drug events in response to inadequate pharmacy services causing critical medication safety incidents [3], to provide clinical pharmacy review in a more timely and targeted manner [4,5] and identify complex patients in need of referral to a more experienced clinical pharmacist.[6]

Our hospital pharmacy department, has designed its own PAST in a bid to help teams of clinical pharmacists prioritise both the frequency, and the seniority, of pharmacists performing patient reviews.[7] The development of the PAST as a screening tool is described elsewhere.[7] Briefly, patient acuity levels (lowest = 1 to highest = 3) are calculated by the ward pharmacist manually using the tool (see Figure 1) and patients with higher patient acuity levels are expected to receive more intensive pharmaceutical input to reduce the risk of adverse drug events. However it was only partially successful as the documented patient acuity level (PAL) only matched the expected acuity level derived from using the tool in 57% of patients[7]. The clinical services managers felt that if the department was going to reliably use the assessment tool to prioritise pharmaceutical care there was a need to refine the tool by finding out why pharmacists did not appear to follow the guidance in all patients.

The aim of this study was establish what pharmacists knew and thought about the current pharmaceutical assessment screening tool to assess the level of patient acuity and what factors they utilised to assign a level on a daily basis.



Guide for initial allocation of Pharmaceutical Assessment Level

Level 3 Patients

- Patient is severely unwell with more than >1 acutely decompensated organ (kidney, liver, heart, lung, bone marrow, brain)
- Patient is on a High Risk Medicine (HRM) or a medicine requiring Therapeutic Drug Monitoring (TDM) plus 1 acutely decompensated organ
- Patients stepped down from ICU or under review by ICU outreach team
- An acute admission managed (or jointly managed) by an Infectious Diseases (ID) Consultant
- Cystic Fibrosis, Organ transplant or HIV patients
- Being considered for Home IVs / ASPIRE service
- PD patient on Apomorphine pump
- On a high cost PbR medicine (eg Posconazole) or being considered for one (e.g. Anti TNF for IBD)
- **Patient's condition or drug therapy regimen outside of the competency of the band 6 pharmacist**

Level 2 Patients

- Patients is on a High Risk Medicine (HRM)*
- Patient is on a medicine requiring Therapeutic Drug Monitoring (TDM)
- Patient has 1 acutely decompensated organ

Level 1 Patients

- Low risk medicines only
- Limited co-morbidities
- Medicine regimen stable
- Clinically stable
- Medically fit and awaiting care packages for discharge

***High Risk Medicines (HRM)**

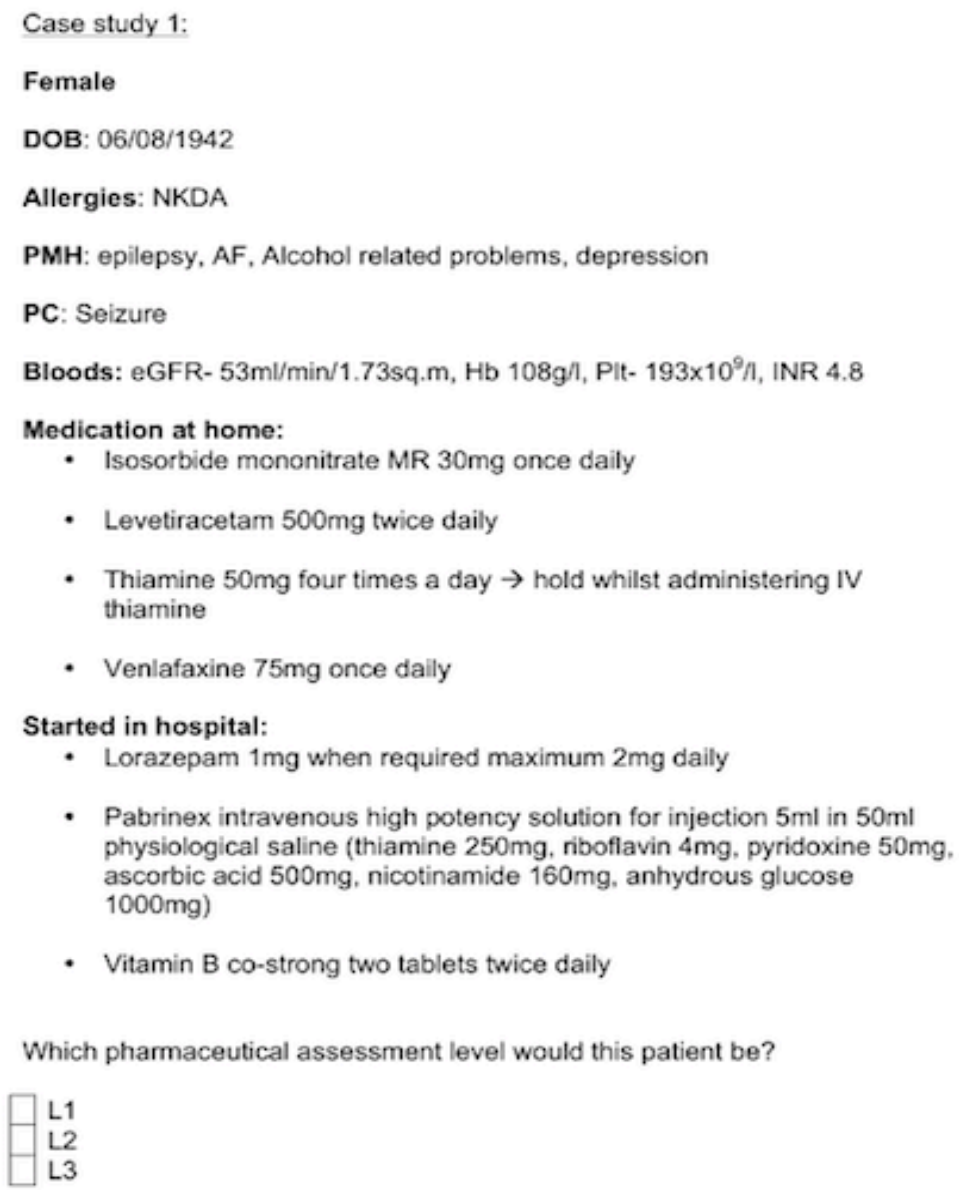
- Anti-Coagulants Warfarin and NOACs (excluding enoxaparin ≤ 40mg daily)
- Insulin
- Regular strong Opiates (excluding Codeine/ Dihydrocodeine, Tramadol)
- Drugs with a Narrow Therapeutic Index
- Chemotherapy
- Antiretrovirals
- Clozapine

Figure 1: Pharmaceutical Assessment Screening Tool

Method

All 32 pharmacists who provided ward based pharmaceutical care for medical, surgical maternity and paediatric patients in the 900 bed UK university teaching hospital were invited to take part in the study. Pharmacists working solely on intensive care units (ICU) and in the cystic fibrosis centre (CF) were excluded as all ICU and CF patients are automatically assigned the highest PAL. Pharmacists covering mental health or community step down units were also excluded, as they do not currently use the tool in practice.

A questionnaire was designed to elicit the attitudes and opinions of the pharmacists towards the pharmaceutical assessment screening tool using questions featuring a five point Likert scale and an opportunity for free text response. Questions aimed to understand pharmacists' confidence and perceived usefulness of the PAST and whether improvements could be made. Six theoretical patient case studies were devised by the clinical research team based on actual patients seen at the hospital (see Figure 2). The case studies consisted of two level 3 (L3) patients, three level 2 (L2) patients and one level 1 (L1) patient. Pharmacists were asked to document what patient acuity level they would assign each patient, if they saw them on their ward, and to give an explanation of why that particular acuity level was chosen.



Case study 1:

Female

DOB: 06/08/1942

Allergies: NKDA

PMH: epilepsy, AF, Alcohol related problems, depression

PC: Seizure

Bloods: eGFR- 53ml/min/1.73sq.m, Hb 108g/l, Plt- 193x10^9/l, INR 4.8

Medication at home:

- Isosorbide mononitrate MR 30mg once daily
- Levetiracetam 500mg twice daily
- Thiamine 50mg four times a day → hold whilst administering IV thiamine
- Venlafaxine 75mg once daily

Started in hospital:

- Lorazepam 1mg when required maximum 2mg daily
- Pabrinex intravenous high potency solution for injection 5ml in 50ml physiological saline (thiamine 250mg, riboflavin 4mg, pyridoxine 50mg, ascorbic acid 500mg, nicotinamide 160mg, anhydrous glucose 1000mg)
- Vitamin B co-strong two tablets twice daily

Which pharmaceutical assessment level would this patient be?

☐ L1
☐ L2
☐ L3

Figure 2. Example case study

The initial questionnaire was pre-tested with five pharmacists; minor changes were then made to the wording of a number of questions. After the amendments the questionnaire was distributed to all pharmacists both by email and by internal post. Participants were given one week to anonymously complete and return the questionnaire to the lead researcher (KS). Three email reminders were sent during the week to try to improve the response rate.

The data collected from the questionnaires was analysed using Microsoft Excel®. The level of agreement between all respondents and the expected patient acuity levels was assessed using the kappa statistic (K) using Stata v12 (StataCorp, TX., USA).

As this was a service evaluation project, ethics approval was deemed unnecessary by the hospital's research and development department.

Results

Pharmacist demographics

Within the pharmacy department 28/32 pharmacists completed the questionnaire giving a response rate of 87.5%. The respondents comprised of 5/28 (18%) pharmacists qualified <1year, 7/28 (25%) pharmacists qualified 1-4 years, 6/28 (21%) pharmacists qualified >4-10years and 10/28 (36%) pharmacists qualified >10 years.

The results from the questions are presented in Table 1.

Question	Results
What is the main factor when deciding on the patient acuity level (PAL) of a patient?	2/28 (7%) used the PAL guidance as the main factor 21/28 (75%) used professional judgment as the main factor 5/28 (18%) used a mixture of professional judgement and the guidance as the main factor.
Confidence when assigning a PAL to a patient.	Mean confidence (SD) = 81% (20%) Median confidence = 82% (Range 0-100%)
The PAST guidance helps me decide an appropriate PAL for each patient on the ward.	4/28 (14%) strongly agree 20/28 (71%) agree 2/28 (7%) neither agree or disagree 2/28 (7%) disagree 0/28 (0%) strongly disagree

My professional judgement is what mainly guides me when allocating a PAL for patient on the ward	14/28 (50%) strongly agree 12/28 (43%) agree 2/28 (7%) neither agree or disagree 0/28 (0%) disagree 0/28 (0%) strongly disagree
When assessing a PAL I use a mixture of my own professional judgment and the guideline.	16/28 (57%) strongly agree 9/28 (32%) agree 0/28 (0%) neither agree or disagree 1/28 (4%) disagree 2/28 (7%) strongly disagree
How useful the pharmaceutical assessment level is as a tool to monitor patients appropriately	Mean confidence (SD) = 70% (25%) Median confidence = 79% (Range 0-100%)
To complete the pharmaceutical assessment level accurately, I believe that more training is required.	3/28 (11%) strongly agree 6/28 (21%) agree 12/28 (43%) neither agree or disagree 6/28 (21%) disagree 1/28 (4%) strongly disagree

Table 1. Questionnaire responses

Comments from the open text section of the questionnaire included:

-What is the main factor when deciding on the patient acuity levels of a patient?

"It should be noted that I don't get regular technician support so although a patient doesn't always require a pharmacist review, they need to be seen by someone for new medication, I level patients higher than expected sometimes to ensure they are seen."

(Pharmacist qualified for >4 – 10years)

-How do you think the patient acuity levels could be improved?

"To have a separate pharmacy handover sheet with jobs to follow up for each patient."

(Pharmacist qualified for < 1 year)

"The biggest problem is updating the PAL status. It is easy to allocate a PAL on admission to prioritise attention but if it is not updated during admission patients can get overlooked."

(Pharmacist qualified >4 - 10 years)

"It is most difficult when covering wards for one day as sometimes I am unsure of how up to date the PAL is for each patient."

(Pharmacist qualified for >4 –10 years)

Table 2 highlights the differences between respondents' reporting patient acuity level and the level expected using the pharmaceutical assessment screening tool.

	Case study 1 (L2)	**Case study 2 (L1)**	**Case study 3 (L2)**	**Case study 4 (L3)**	**Case study 5 (L2)**	**Case study 6 (L3)**
L1	0/28 (0%)	**4/28 (14%)**	0/28 (0%)	0/28 (0%)	4/28 (14%)	0/28 (0%)
L2	**22/28 (79%)**	24/28 (86%)	**20/28 (71%)**	2/28 (7%)	**22/28 (79%)**	21/28 (75%)
L3	6/28 (21%)	0/28 (0%)	8/28 (29%)	**26/28 (93%)**	2/28 (7%)	**7/28 (25%)**

Table 2: Pharmacists' PAL allocation to the case studies

The overall strength of agreement between respondents and the expected acuity levels was considered to be 'fair' (K =0.202)[8].

As it was thought that the experience and knowledge of a pharmacist could affect the allocation of a PAL the strength of agreement when allocating PAL extremes between pharmacist groups with different levels of experience was also tested. The combination of L1 and L3 were used as one extreme and compared with L2. Results presented in Table 3.

	Kappa statistic (K) [8]
Qualified <1 year expected PAL	0.074 ("poor")
Qualified 1 – <4 years expected PAL	0.081 ("poor")
Qualified 5 – <10 years expected PAL	0.142 ("poor")
Qualified >10 years expected PAL	0.073 ("poor")

Table 3: Results of the Kappa statistic for pharmacists qualified a different number of years when allocating PAL extremes

Discussion

Overall pharmacists were very confident about using pharmaceutical assessment screening tool, and agreed that it helped to assign an acuity level and monitor the pharmaceutical needs of inpatients. However, pharmacists appear to rely more on professional judgement than the tool itself to assign a PAL, regardless of experience. The differences in PALs

assigned for the case study patients gave a good illustration of the variations between pharmacists and likely use of professional judgment.

In four of the case studies 10/28 (36%) of pharmacists allocated a higher level then recommended in the guidance tool and in three of the case studies 9/28 (32%) pharmacists allocated a lower PAL, the research team found the same when they assessed the allocation of PALs in daily practice[7] . The departmental pharmaceutical care standards state that a L3 patient should be seen every weekday by a senior pharmacist, a L2 patient should been seen by any pharmacist 2 or 3 times a week, and a L1 patient can be managed by a pharmacist or pharmacy technician unless their medication or clinical condition changes.

The case study patients all had different co-morbidities and in three of the case studies the patients had one decompensated organ and were not on any high risk medications, so would have been expected to have been classified as L2 using PAST. The different levels allocated for patients may again reflect the pharmacists' professional judgement and experience on what they feel comfortable managing.

Experienced pharmacists may be allocating a lower PAL to a patient as they feel comfortable managing the patient at a lower level. In comparison less experienced pharmacists may professionally feel less confident and want to assign a higher acuity level to ensure the patient is seen more frequently and by a more experienced pharmacist.

The most notable variation in PAL choice was between the two L3 cases, 26/28 pharmacists (93%) correctly allocated case study 4. The patient had one decompensated organ (the brain), active treatment for prostate cancer (goserelin) and he was also "nil by mouth". However in case study 6, 21/28 pharmacists (75%) assigned a lower level (L2) than PAST would have recommended (L3), this patient had two decompensated organs (the lung and kidneys). The difference may be due to the perceived severity of the decompensated organs and what pharmacists feel more competent to manage due to experience (e.g. community acquired pneumonia and acute kidney injury are pharmaceutically managed more commonly than a subdural bleed and active prostate cancer).

In the other major deviation 24/28 pharmacists (86%) assigned case study 2 a higher PAL (L2), than recommended in PAST (L1). This patient had been diagnosed with a urinary tract infection and had been prescribed trimethoprim. Their past medical history included; chronic back pain, angina, epilepsy and dementia but the medication regimen was stable and included sodium valproate and regular codeine. Codeine is excluded from the high risk medicines category as it is only a weak opiate but it is possible that the majority of pharmacists identified sodium valproate as a drug requiring therapeutic drug monitoring

(even though serum levels are only used to detect non adherence) thus allocating the patient a L2 status.

Overall the strength of agreement was 'fair', indicating that there was not a true agreement with PAST[8]. This may reflect the over and under estimation of allocated PALs seen in the case studies and again emphasises the pharmacist's use of professional clinical judgement when assigning a PAL. Exploration of the agreement between PAL extremes for the different levels of pharmacy experience showed that the strength of agreement was 'poor'. This suggests that the majority did not agree with the structured PAL guidance allocation for L2 patients. The overall results from this, and out previous study[7] indicates that the criteria for all the levels of the patients are clearly in need of further review, which should encourage the tool to be used more consistently in practise.

Confidence in an assessment screening tool may also be improved by ensuring the tool is fully validated to detect adverse drug events such as that designed by Urbina and colleagues in a Spanish hospital pharmacy department[9].

The open text answers provided further insightful views about the limitations of the PAST. The most prominent limitation is that the PAST is at times used as a system to remind pharmacy team members that they need to follow up a patient, especially on wards where there is not a regular pharmacy technician and the review may only involve a supply of medication. There was also a lack of confidence about how up to date the PAL was on the ward's patient identification boards after admission. This lack of confidence could mean that patient's who do not need to be reviewed regularly are being reviewed whilst patients who have become acutely unwell during their hospital admission are being overlooked.

Despite confidence about using PAST a third of respondents believe more training is needed in order to use it more effectively. Cottrell et al., found that the usefulness of a pharmacy risk screening tool required substantial involvement by the pharmacy staff[3] and Hickson et al., suggested that re-iterating the true purpose of the tool could improve its reliability[7].

The strength of the study was that the questionnaire had an excellent response rate, which instils confidence that the results reflected the whole department and not solely either junior or senior pharmacists. A limitation is that the questionnaire results only reflect the attitudes of pharmacists at one hospital and so its application elsewhere may not be valid. Deeper insights into the use and understanding of the tool by pharmacists may also have been possible using more searching qualitative research methods, such as focus groups or interviews.

For future research it would be beneficial to conduct intensive staff training after redesigning and validating the tool and then reassess adherence to it.

Conclusion

Pharmacists feel confident about using a pharmaceutical assessment screening tool to help them assign a patient acuity level and monitor patients' pharmaceutical needs whilst in hospital. However the use of professional judgement to assign a patient acuity level overrides any predicted level from the tool itself.

Careful design of validated screening tools, with appropriate training on their use, is required if such tools are to be successfully utilised by pharmacy departments to target which patients need to be seen more frequently, and by an appropriately experienced clinical pharmacist, and ultimately fulfil their promise to prevent adverse drug events in hospital inpatients.

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