

1 **Title:** The Pupil's P's: An Alliterative Tool and Practical Framework for Managing Older Patients

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33 **ABSTRACT.**

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35 Geriatrics encompasses all specialties of medicine. Therefore, medical students must be aware of many  
 36 factors during their geriatrics rotation. Herein, we distil our reflections from medical school into employment to  
 37 create a practical framework using an novel alliteration in: *The Pupil's P's*. We acknowledge and complement  
 38 existing mnemonics devices, which are largely based on diagnosis, to introduce medical students to major  
 39 geriatric topics to assist management whilst they round on their patients – *Peculiar Presentations,*  
 40 *Psychological Perturbations, Peristaltic Products, Profound Pain, Polypharmacy, Pressure Sores,*  
 41 *Physiological De-conditioning, Poor Perception, Partner Practitioners, Post-Hospital Plan, Palliative Care, and*  
 42 *Parsimony*. For students of geriatric medicine, The Pupil's P's literary device creates a succinct, educative tool  
 43 with the added utility as a reference to generate the multi-factorial reasoning required to care for older  
 44 patients. Ultimately, through our experience in aged care, we wish to convey the important lesson of holistic,  
 45 patient-centered care to students. Accordingly, despite the numerous issues that may be encountered with  
 46 older patients, we emphasize treating the patient holistically, and not the individual problems which may be  
 47 discovered.

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49 **Key Words:** Geriatrics, Gerontology, Aged Care Medicine, Medical Education, Geriatric Conditions

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51 **INTRODUCTION.**

52 Geriatrics is founded on the wisdom of its practitioners, patients and pupils. In patients over 65, 23% of global  
 53 disease burden is attributable,<sup>1</sup> and 50% have 1 or more 'geriatric conditions' – referring to the collective signs  
 54 and symptoms common in elderly patients.<sup>2-3</sup> To address complex geriatric conditions, compounded by time,  
 55 geriatrics mandates a multi-factorial, hypothesis-driven approach. Thus, optimizing aged care must coordinate  
 56 numerous, major issues. In 1965, 'Isaac's I's'<sup>3,4</sup> – *instability, immobility, incontinence and impaired*  
 57 *intellect/memory* – were coined to encapsulate elderly-patient ailments. In 2017, 'Mary's M's',<sup>5</sup> - *mind,*  
 58 *mobility, medications, multi-morbidity, and matters most* – sought to encompass more features of aged care.  
 59 Due to the complexity of geriatric patients, medical students are deterred from the aged care specialty.<sup>6</sup>  
 60 Globally, there are gaps in geriatric education of medical students which requires meaningful and broad  
 61 curricula proportionate to ageing population demographics.<sup>7</sup> With these shifting demographics, prioritizing  
 62 medical education for aged care will improve healthcare for all.<sup>8</sup> Mnemonics offer a powerful method to  
 63 reshape brain networks, improve memory performance, increase motivation to study, and are reportedly more  
 64 enjoyable than rote rehearsal.<sup>9,10</sup> Accordingly, through our experience, we attempt to reconcile aged care  
 65 principles to provide our own alliterative device for medical students. This tool enhances existing mnemonics  
 66 in aged care by incorporating these ideas into a larger framework which educates students to optimize the  
 67 care of older people. Here, we cannot be exhaustive of each issue. Rather, we aim to introduce each issue for  
 68 students to contemplate on their rounds. Together with the insight and contribution by an accomplished  
 69 geriatrician, this instrument was distilled by the experiences and reflections of a resident from medical school  
 70 into employment. For posterity and students of aged care. who will inevitably be at the coalface taking care of  
 71 an ageing population, we deliver these portable, alliterative learnings: *The Pupil's P's*.

72 1. *Peculiar Presentations*

73 For these prevalent 'geriatric conditions', we stand upon the shoulders of 'Isaac's Geriatric Giants': instability  
 74 (6-22%), incontinence (9-27%), immobility, iatrogenesis and impaired intellect or memory (3-31%).<sup>3</sup> More  
 75 have been proposed: frailty, sarcopenia, and anorexia of ageing (1.3-12%).<sup>2,4</sup> From medical school, we  
 76 suggest students consider such hallmark precipitants for presentations. Otherwise, an unclear, confused  
 77 historian or unremarkable examination make it difficult to generate reasoning and management. Collateral  
 78 history and family involvement are indispensable. A common presentation in older people is a fall with neck of  
 79 femur fracture. Here, there is a necessary cause of their fall and fracture. For example, delirium causing

80 confusion (*impaired intellect*) secondary to urinary tract infection or overflow constipation (*incontinence*)  
81 compounded by gait imbalance (*instability*) and complicated by osteoporosis (*immobility*).

82

### 83 2. *Psychiatric and Psychological Perturbations*

84 Given the brain's importance in aged care, cognition testing must not be overlooked. On rounds, delirium,  
85 depression, and dementia can be screened for swiftly. The Diagnostic and Statistical Manual of Mental  
86 Disorders (**DSM-V**) provides the elements for each neurocognitive disorder.<sup>11</sup> By utilising the 4 'A's Test (**4AT**)  
87 – that is, a widely-used, efficient screening tool incorporating Abbreviated Mental Test-4 for orientation,  
88 Alertness, Attention and Acute fluctuations – students can consider delirium and these conditions alongside  
89 possible causes.<sup>12</sup> Alternatively, the Mini Mental State Examination (**MMSE**)<sup>13,14</sup> and Confusion Assessment  
90 Method (**CAM**)<sup>15</sup> are validated, widely-used screening tools. Often, causes of delirium include: pain, infection,  
91 nutrition, constipation, hydration, endocrine and electrolytes disturbances, stroke, medications and alcohol.  
92 Hypoactive delirium – characterised by reduced motor activity, lethargy, withdrawal – is under-recognized and  
93 its causes should be evaluated and managed accordingly.<sup>16</sup> Fundamentally, the key features of delirium  
94 differentiating it from dementia are: decreased attentiveness/awareness and a fluctuating course in cognition.  
95 For example, patients may be mentating appropriately in the morning and behaviourally difficult in the  
96 evening. Behavioural and sleep charts are extremely helpful. When assessing mentation, it is also an  
97 appropriate time to establish capacity for medical decision-making and advanced care directives.

98

### 99 3. *Peristaltic Products*

100 In geriatrics, the 'p-words' denoting products of bowels and bladders are crucial. When seeing older patients,  
101 students should anticipate incontinence, constipation and urinary tract infections (**UTI**) (12.7%),<sup>2</sup> given this  
102 population is disproportionately afflicted by these issues. Brief, non-pharmacological strategies a student  
103 could suggest on rounds to manage urinary incontinence are: implementing a scheduled toileting program,  
104 diarizing fluid balance, physical therapy for pelvic floor exercises, and for constipation: stool diary, bowel  
105 training (optimizing the gastrocolic reflex), adequate fibre intake and hydration and regular exercise.<sup>17</sup>  
106 Students should be informed of common practices which provide little value to hospitalized patients, like the  
107 prescribing of docusate which has significant associated costs and multiple trials failing to show any benefit.<sup>18</sup>  
108 For prolonged admissions and prior to discharge, cystitis symptoms – suprapubic discomfort/pain, dysuria,

109 haematuria, malodorous/cloudy urine, increased frequency, hesitancy or intermittency – should be screened  
110 for and a urine mid-stream culture requested to treat empirically and appropriately. Such proactivity could  
111 prevent re-admission for sepsis, delirium and/or fall precipitated by a UTI.

112

#### 113 4. *Profound Pain*

114 In aged care, students should attempt to identify and classify pain – for example, acute, sub-acute or chronic  
115 and somatic, visceral and neuropathic. Students should recognize that pain is a biopsychosocial  
116 phenomenon.<sup>19</sup> and therefore its experience should be validated and addressed with active and passive  
117 approaches. This permits appropriate decision-making. Non-pharmacological interventions – heat and cold  
118 packs, quiet spaces, mobilization and exercise – are always first-line. Given its regular prescribing in a  
119 hospital setting, simple analgesia should be used at a reduced frequency and duration. For example,  
120 paracetamol 1g three-times-daily provides a buffer in older people who are malnourished, underweight  
121 (generally <50kg) and likely to have decreased hepatic mass.<sup>20</sup> For a 50-kilogram patient, the 1g three-times  
122 daily of paracetamol equates to approximately 15 mg/kg every four-to-six hours, or 60mg/kg/day (not  
123 exceeding 3g daily). Also, students should be cognizant of non-steroidal anti-inflammatory contraindications  
124 found in older patients of asthma, gastrointestinal ulcers, blood dyscrasias, and renal disease/injury.<sup>1</sup>

125

#### 126 5. *Polypharmacy*

127 Polypharmacy is using five or more medications, including prescription, over-the-counter and complementary  
128 medicines.<sup>21</sup> Iatrogenic presentations and symptoms are common (45-52%).<sup>2,21</sup> Age affects  
129 pharmacodynamics – that is, what the body does to a drug. This occurs through loss of reserves, reduction in  
130 lean body mass, reduction in mobility and interactions with the cytochrome p450 system. Commonly,  
131 antidepressants, anticholinergics, antibiotics and diuretics have unintended consequences in older people.  
132 Medical students should consider the updated Beers<sup>22</sup> and STOPP/START<sup>23</sup> criteria which highlight  
133 potentially inappropriate medications in older patients for the purposes of prescribing and deprescribing. In  
134 both the hospital and community settings, involving pharmacists is vital.

135

#### 136 6. *Pressure Injuries*

137 Pressure injuries are localized skin damage resulting from pressure, shear or friction. Typically occurring over  
138 bony prominences, these are associated with acute illness, medical devices including prostheses and  
139 dressings.<sup>2</sup> Pressure injuries are frequent, painful, costly and, mostly, preventable. For immobile, elderly

140 patients, students must consider pressure injury development. The National Pressure Injury Advisory Panel  
141 **(NPIAP)** Staging System classifies pressure injuries into five stages – (1) intact skin with nonblanchable  
142 erythema, (2) partial-thickness skin loss involving epidermis/dermis, (3) full-thickness skin loss, but not  
143 crossing fascia, (4) full-thickness skin loss crossing fascia and (5) unstageable because eschar/slough  
144 obscures extent of tissue damage.<sup>24</sup> For prevention, assess for erythema, blanching, temperature, edema,  
145 induration and skin-breakdown. Medical students can liaise with nursing staff to utilise regular re-positioning  
146 and pressure-relieving devices to avoid pressure injuries.

147

#### 148 7. *Physiological Deconditioning*

149 In geriatric medicine, acute hospital care has its own perils. Prolonged inpatient care can accelerate patient  
150 deterioration; begetting reduced mobility, cachexia and malnutrition. Students should be aware that even ten  
151 days of immobilization and bed rest in healthy older adults results in a one kilogram loss of lean muscle  
152 mass.<sup>25</sup> Rockwood's definition of '*frailty*' encapsulates the interaction of medical and social factors resulting in  
153 a decreased capacity to deal with stressors.<sup>26</sup> Students should be aware of the '*Hallmarks of Aging*' to foster  
154 an appreciation of chronic disease progression, multimorbidity, and translate this into a clinical frailty index or  
155 scales.<sup>26,27</sup> As part of management, students should seek to modify the hospital environment by de-  
156 emphasizing bed rest with patients, remove high rails and bed heights, and suggest early and active  
157 mobilization with physiotherapy and socialization.<sup>28</sup>

158

#### 159 8. *Poor Perception*

160 Students must consider age-related perceptual deficits concerning vision (presbyopia, glaucoma, cataracts,  
161 macular degeneration), hearing (presbycusis), balance and dentition (dentures, false teeth). Older patients  
162 are affected disproportionately (4.6-22.8%) and may have available impairment aids. On rounds, students  
163 could screen for deficits in visual acuity utilising a digital Snellen chart, or an Amsler Grid which can detect  
164 metamorphopsia in age-related macular degeneration. If there is sufficient clinical suspicion for hearing loss, a  
165 referral for audiometry should be made. If not considered, these impairments create poorer prognosis,  
166 delirium, and poor quality-of-life and communication.

167

#### 168 9. *Partner Practitioners*

169 Students must foster collegiality in multidisciplinary care. This benefits diagnosis and management of patients.  
170 Medical practitioners – including general practitioners and specialists – are only one facet of multidisciplinary

171 teams. The role of geriatric medicine remains diagnosis and management to guide and galvanize these  
172 professions. For example, physiotherapists have intimate knowledge of surface anatomy and locomotion,  
173 speech pathologists assess swallowing to prevent aspiration, occupational therapists ensures a safe,  
174 functional home environment, social workers champions crisis relief or orchestrates legal hearings to appoint  
175 surrogate decision-makers, and nurses – specialist and generally-trained – afford comprehensive, patient-  
176 centered care. Students could attend, discuss and observe the assessments and documentation conducted  
177 by these various allied health specialities to grasp their purview. For example, the peri-operative management  
178 of an orthogeriatric patient would necessitate the activation and co-ordination of a multi-disciplinary team. It  
179 would provide a fantastic experience for medical students to appreciate the value in an integrated model of  
180 healthcare.

181

#### 182 *10. Post-Hospital Plan*

183 Discharge planning is an interdisciplinary approach to ensure continuity of care. Early and inclusive discharge  
184 planning cannot be understated. Thus, medical students should learn about discharge destinations and home  
185 care services as soon as practicable on their aged care rotation. A sound comprehension would be highly  
186 useful for clinical practice. Often, discharge planning is the rate-limiting-step to transition an older patient from  
187 hospital to home. Use of an intermediary rehabilitation facility can bridge those requiring specialist support.  
188 Students must understand a person's social factors, finances and decline, and explore carer stress to  
189 formulate and effective, long-term management plan. By attending family meetings, students can appreciate  
190 the logistical and ethical issues in accomplishing safe, effective patient discharge.

191

#### 192 *11. Palliative Care*

193 Palliative care represents a specific, all-inclusive process by which to honor a patient's right to dignity and  
194 comfort. In some instances, supportive care might be a more appropriate term than palliative care where life  
195 expectancy progresses to months. Foremost, students should be aware that advanced care directives must  
196 be established. Using collateral history from family and hospital notes, and considering the relevant local law,  
197 students should assess the appropriate decision maker in each case. These include the patient, next of kin,  
198 friend, and/or neighbor. If appropriate, establishing end-of-life care by involving family and palliative care  
199 colleagues is vital. Depending on the circumstances of each case, students should observe these discussions  
200 to identify from the patient's desires restorative versus supportive goals. For example, in palliative care, the

201 survival period is not the singular determinant of treatment; life prolongation is a secondary objective to  
 202 quality of life and symptomatic relief. Important questions to consider are whether a patient desires. Ensuring  
 203 there has been some discourse on the topic of cardiopulmonary resuscitation, intubation and intensive care  
 204 helps to determine the desired clinical outcomes. Fundamentally, to deliver holistic care, geriatrics mandates  
 205 interdisciplinary medical, psychosocial, cultural and spiritual considerations.

206 *12. Parsimony*

207 Parsimony – that is, doing no more than is necessary – is paramount in caring for elderly patients (Figure 1).  
 208 Too often, practitioners sustain momentum bias in diagnosis and management. This produces unnecessary  
 209 medical intervention(s). Oddly, William of Ockham’s Razor – ‘plurality must not be posited without necessity’ –  
 210 is the Principle of Parsimony. In geriatrics, students should appreciate Ockham’s Razor is antithetical to  
 211 diagnosis because, as we have emphasized, co-maladies warrant the generation of multiple differential  
 212 diagnoses.<sup>29</sup> A ‘goals of care’ clinical framework which entails a three-phase model can classify a patient’s  
 213 care as either curative, palliative, or terminal according to an assessment of likely treatment outcomes for the  
 214 particular patient. This method allows students to practice avoiding overdiagnosis and overtreatment whilst  
 215 guaranteeing comprehensive patient-centered care.<sup>30</sup> In this complex management of older patients, we must  
 216 always treat the patient before us; not the problem(s) we uncover.

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218 Figure 1: The Pupil’s P’s – a conceptual framework and educational tool for comprehensive geriatric  
 219 assessment

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222 Table 1: The Pupil’s P’s – Summary and management strategies/learnings for medical students

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224



225 **CONCLUSION**

226 As in life, gerontology is a rite of passage in medical school and healthcare. By experiencing aged care, we  
227 have come to appreciate its medical and social sophistication. Despite many attempts, honing this fount of  
228 knowledge is near impossible. For the aged care pupils, we have provided an alliterative introduction and tool  
229 to manage elderly patients on the ward or in the community. It is our hope that this piece orientates the aged  
230 care student and serves as a reference on ward rounds to learn about and manage older people. Using this  
231 platform, we encourage students to integrate these principles into clinical practice. Regardless of their chosen  
232 specialty, we urge students to reflect on their experiences in geriatrics for their medical careers. To students,  
233 we offer *The Pupil's P's* for the comprehensive care of older people – forever treating the patient; not the  
234 problem.

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Figure 1: The Pupil's P's – a conceptual framework and educational tool for comprehensive geriatric assessment

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327 Table 1: The Pupil's P's – Summary and management strategies/learnings for medical students

'P'	Management Strategy/Learning
Peculiar Presentations	<ul style="list-style-type: none"> <li>• Note <i>Issac's I's</i> and <i>Mary's M's</i> – <i>The Geriatric Giants</i></li> <li>• Gain collateral history</li> <li>• Involve patient's family early</li> </ul>
Psychological Perturbations	<ul style="list-style-type: none"> <li>• Screen cognition and depression – 4AT, MMSE or CAM</li> <li>• Evaluate causes and manage accordingly</li> <li>• Establish decision-making capacity</li> </ul>
Peristaltic Products	<ul style="list-style-type: none"> <li>• Anticipate incontinence, constipation, UTI</li> <li>• Employ non-pharmacological strategies first-line</li> <li>• Be proactive in identifying and treating UTIs</li> </ul>
Profound Pain	<ul style="list-style-type: none"> <li>• Recognise and classify as biopsychosocial phenomenon</li> <li>• Employ non-pharmacological strategies first-line</li> <li>• Dose-adjust simple analgesia on weight or renal function</li> </ul>
Polypharmacy	<ul style="list-style-type: none"> <li>• Assess prescriptions where &gt;5 medications</li> <li>• Consider Beers and/or STOPP/START criteria</li> <li>• Involve inpatient/community pharmacy</li> </ul>
Pressure Injuries	<ul style="list-style-type: none"> <li>• Consider in all unwell, geriatric patients</li> <li>• Stage pressure based on NPIAP system</li> <li>• Suggest regular re-positioning/pressure sore devices</li> </ul>
Physiological Deconditioning	<ul style="list-style-type: none"> <li>• Acknowledge hospital-induced deconditioning</li> <li>• Note patient's Frailty Score</li> <li>• De-emphasize bed-rest &amp; begin early mobilization</li> </ul>
Poor Perception	<ul style="list-style-type: none"> <li>• Inquire for vision, hearing, balance and dentition</li> <li>• Ensure patient aids are available</li> <li>• Screen with Snellen chart, Amsler grid, audiometry</li> </ul>
Partner Practitioners	<ul style="list-style-type: none"> <li>• Early activation of multidisciplinary care</li> <li>• Discuss and observe allied health assessments</li> <li>• Shadow peri-operative Orthogeriatrics admission</li> </ul>
Post-Hospital Plan	<ul style="list-style-type: none"> <li>• Discharge planning begins once medically stable</li> <li>• Learn about discharge destinations early in rotation</li> <li>• Attend family meetings</li> </ul>
Palliative Care	<ul style="list-style-type: none"> <li>• Palliative care prioritises dignity and comfort</li> <li>• Aimed at quality of life and symptomatic relief</li> <li>• Survival period is secondary objective</li> </ul>
Parsimony	<ul style="list-style-type: none"> <li>• Do no more than necessary to patients</li> <li>• Goals of care phases direct management</li> <li>• Treat the patient; not the problem(s)</li> </ul>

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