NU-01 Nursing as the main medicine: Nightingale's statistics and the care of the bedridden

HEALING after the FALL, research library, NU-01

Researched 10 October 2026 by Claude Opus agent for THRIVING after the FALL, Book Four. Library document, unverified.

1. Findings by section

This report sets the frame that NU-02 (fluids and feeding), NU-03 (the sickroom), NU-04 (rehabilitation) and NU-09 (the long-term patient) build on. Three things are kept apart throughout: what the tradition claims, what the record shows, and what modern science infers. Two leads in the brief could not be used: Gill and Gill's 2005 reexamination is paywalled, and Hampton's Nursing: Its Principles and Practice (1893) was reached only through a 1906 review of a later edition. Nothing is argued or quoted from either (Gill and Gill 2005, abstract only, Robb 1893, not read).

1.1 Scutari: the founding story, and what the numbers actually show

The legend. Florence Nightingale reached the Barrack Hospital at Scutari in November 1854 with thirty-eight nurses. Mortality among cases treated there reached nearly 43 per cent in February 1855 and had fallen to about 2 per cent by June. The story as usually told is that she cleaned the wards and the deaths stopped.

What the record shows. The "nearly 43" per cent figure is Nightingale's own, for the worst single month, calculated on cases treated rather than on an average sick population (Nightingale 1859, in McDonald n.d.). It is not an annual death rate and is not comparable with the figures set beside it. From June 1854 to June 1856 the Scutari hospitals together recorded 11.9 per cent deaths over admissions, Koulali, not under Nightingale, 25.9 per cent, and Brunel's prefabricated hospital at Renkioi, built for ventilation and open from October 1855, 3.8 per cent (McDonald n.d., THRIVING library HY-01). The turning point is March 1855, when the Sanitary Commission under Dr John Sutherland flushed the sewers, opened the ventilation, closed the Stable Hospital and the two hospital ships, and removed 202 cartloads of filth in its first week. Nightingale's own polar-area diagrams mark the same break, she blamed the deaths on sanitary defects rather than on her nurses, and she never claimed the fall for herself.

Hugh Small's case. Small (1998) argued that Nightingale's hospital was the worst in the theatre and that she did not understand sanitation until after the war. His strongest evidence is a table from an annex to her confidential 1858 report, October 1854 to April 1855, republished in 2020: of 53,913 men admitted to hospital, 12,518 were sent on to Scutari and 4,522 of them died, 36 per cent, against 5,341 of the 41,395 who stayed in the Crimea, 13 per cent (Small 2020, full table). It is confounded, because the men shipped across the Black Sea were those judged too sick to keep, and McDonald replies that Small used round numbers and unlike groups and that no separate figures exist for "her" hospital because official rates combine four to seven hospitals. The verdict is that being sent to Scutari that winter was close to a sentence, that selection explains an unknown share of it, and that nobody has separated the two.

The verdict for this book. Drains, ventilation, crowding and water did the work at Scutari, and the chapter's thesis

is weakened by leaning on it. What Nightingale contributed came afterwards: a method of counting deaths, the 1858 demonstration that soldiers in barracks at home died at 17.0 per 1,000 a year against 8.4 for English civilian men of the same ages (Nightingale 1858, in English Woman's Journal 1858), and the 1860 book that turned nursing into a set of rules. Her 1863 principle is the one to keep: "It may seem a strange principle to enunciate as the very first requirement of a Hospital that it should do the sick no harm" (Nightingale 1863). Her lying-in returns cut against the romance of the institution too: 888,312 institutional deliveries with 30,394 deaths, 34 per 1,000, against the Registrar-General's 5.1 per 1,000 for women delivered at home (Nightingale 1871, THRIVING library HY-01).

1.2 What "nursing" means as a medicine, and the three claims inside the thesis

The thesis is three claims of very different evidential strength, and the book should separate them.

Claim one, the strong claim. Skilled nursing changes mortality in acute illness. The support is indirect, from Osler's arithmetic and the staffing studies below, and the effect is real but smaller than the legend.

Claim two, the middle claim. Nursing is the whole of the treatment for the conditions nursing itself causes. Pressure injury, aspiration pneumonia, contracture, faecal impaction, catheter infection and delirium are iatrogenic conditions of the bed, their mechanisms certain and their causes removable, while the trials of specific schedules are poor.

Claim three, the one nobody disputes. When there is no drug, nursing is the only treatment that exists, so its value is not what it adds to medicine but what medicine would have added to it. After the Fall this is the operative claim, and it is why a book for a village spends more pages on turning, feeding and mouths than on pharmacology.

A fourth point is not about efficacy: nursing is also the vehicle by which everything else reaches the patient, which belongs to NU-02.

1.3 The bedridden body: pressure injury

The tradition's claim. Nightingale's dictum is flat: "if he has a bed-sore, it is generally the fault not of the disease, but of the nursing" (Nightingale 1860). The 1918 American Red Cross text makes it a schedule: wash the pressure points at least twice a day with warm water and soap, rub them with alcohol, relieve pressure with pillows and pads, and turn an emaciated patient "at least once every waking hour" (Delano and Strong 1918, chapter VIII). The household manual is stricter than the modern two-hourly rule, not looser.

The mechanism. Load occludes the small vessels over a bony prominence. Kosiak is the usual citation: unrelieved pressure of about 70 mmHg produced pathological change at about two hours, while the same pressure five minutes on and five minutes off produced none (Kosiak 1961, read only through secondary quotation) [VERIFY]. The "capillary closing pressure of 32 mmHg" in every nursing text is a convention, not a measurement, critics say Kosiak's small data set does not justify the pressure-time curve drawn from it, and shear matters as much as perpendicular load [VERIFY: wound-care review read as a search summary].

Incidence. Among 19,889 residents in 51 American nursing homes, 11.3 per cent arrived with a stage II to IV ulcer, and of those admitted without one 13.2 per cent had one at a year, 21.6 per cent at two (Brandeis et al 1990, abstract and secondary summaries). In 2004 about 11 per cent of 1.5 million United States nursing-home residents had an ulcer of any stage (CDC/NCHS 2008). Sacrum, heel and ischium carry most of them [VERIFY: review read as search summary].

The trials of turning. The two-hourly turn is the most confidently repeated number in nursing, and it is not supported.

- Defloor and colleagues randomised 838 geriatric nursing-home patients over 28 days to two or three-hourly turning on a standard mattress, four or six-hourly on viscoelastic foam, or standard care. Grade II or worse ulcers occurred in 3.0 per cent of the four-hourly viscoelastic group against 14.3 to 24.1 per cent in the others,

while non-blanchable erythema did not differ, 34.8 to 38.1 per cent everywhere (Defloor et al 2005, abstract and PEDro record). Unblinded, PEDro 6 of 10.

- Moore and colleagues cluster-randomised twelve long-term care sites. Three-hourly repositioning at night on a 30 degree tilt gave 3 ulcers in 99 patients against 13 in 114 on six-hourly 90 degree turns, all grade 1 or 2 (Moore et al 2011, abstract).
- Bergstrom and colleagues randomised more than 900 residents at moderate or high Braden risk, all on high-density foam, to two, three or four-hourly turning. No significant difference, overall incidence 2 per cent, all stage I or II (Bergstrom et al 2013, secondary summaries).
- The Cochrane review (Gillespie et al 2020, CD009958.pub3, searched February 2019) pooled three trials and 1,074 participants for two-hourly against four-hourly and found no significant difference, very low certainty. For 30 against 90 degrees, two trials, 252 participants and 21 events, risk ratio 0.62 (0.10 to 3.97), very low certainty.

The pattern is that the surface matters more than the clock. Where it redistributes load, four-hourly is as good as two-hourly and may be better, because each turn shears the skin and wakes the patient. Where the surface is hard, nothing saves the patient. For a village the conclusion is clear: spend effort on the mattress before the schedule.

A surface a village can make. Jolley and colleagues randomised 441 hospital inpatients at low to moderate risk in Melbourne in 2000. Ulcers arose in 21 of 218 with an Australian Medical Sheepskin overlay against 37 of 223 without, 9.6 against 16.6 per cent, rate ratio 0.42 (0.26 to 0.67) (Jolley et al 2004). Open-label, PEDro 5 of 10, and stage 1 ulcers are hard to judge, so the effect is probably overstated. It remains the most transferable finding here.

Risk scores and feeding. The Braden and Norton scales barely discriminate, area under the curve 0.56 (0.51 to 0.61) and 0.55 (0.49 to 0.60) in 1,229 patients (read as search summary) [VERIFY: not read in full], and the Cochrane review found structured tools make little or no difference against clinical judgement (Moore and Patton 2019, summarised). For a lay carer the instrument is a hand, not a score. Nutrition is the same: supplements may make little or no difference to the proportion developing an ulcer, risk ratio 0.92 (0.71 to 1.19), three studies, 1,634 participants, low certainty (Langer et al 2024, abstract and summaries). The brief's lead to Langer 2003 points at the first version of this review, whose conclusion was the same [VERIFY: I read the 2024 and 2014 abstracts, not the 2003 original]. Feed a bedridden person for every other reason, but not as ulcer prevention. Staging by hand is in Protocol 3.

1.4 Feeding, swallowing, and the error that kills quietly

The tradition. "Thousands of patients are annually starved in the midst of plenty." Nightingale demands punctuality to the minute for the very weak, because "life often literally hangs upon these minutes", forbids leaving untasted food at the bedside, and recommends a spoonful every hour where a cup is refused (Nightingale 1860, chapters VI and VII). The Red Cross ration is 6 to 8 ounces of liquid diet every two or three hours (Delano and Strong 1918, chapter IX).

The error. Aspiration is the quiet killer of the bedridden and the most preventable death in this report. The 1918 manual names the rule: present the spoon at right angles to the lips, allow time between mouthfuls, and never give a swallow as the patient breathes in (Delano and Strong 1918, chapter IX). The modern equivalents are a swallow screen and sitting upright.

What the record shows. A meta-analysis of six studies of dysphagia screening after acute stroke found pneumonia at odds ratio 0.60 (0.42 to 0.84) in the screened groups, heterogeneity I squared 66 per cent, no difference in mortality (systematic review 2021, abstract and summary). In the HeadPoST analysis of 11,093 patients, those who failed a screen had adjusted odds of pneumonia of 3.00 (2.18 to 4.10), and those then put on feeding restrictions 4.06 (1.72 to 9.54) (read as summary). Identifying the unsafe swallower and then starving them is worse than not identifying them.

The patient who cannot swallow at all. Finucane and colleagues searched to 1999 for evidence that tube feeding

in advanced dementia prevents aspiration, prolongs survival, reduces pressure sores or infections, improves function or gives comfort. They found no randomised trials and no data showing benefit, with several case-control studies suggesting tube feeding was a risk factor for pneumonia and death (Finucane et al 1999, abstract and secondary summaries). The editorial beside it reported aspiration in up to half of tube-fed patients whatever the tube. A village will never have a gastrostomy, and this is one of the rare places where the Fall takes nothing of value. The rule NU-09 should develop: careful hand feeding, upright, small volumes, unhurried, with the mouth cleaned afterwards, is the best that exists for someone losing their swallow, and a person who cannot take enough by mouth is dying.

1.5 The mouth

The strongest single nursing finding in this report, and the cheapest. The claim: clean the mouth and you prevent pneumonia, because the pneumonia of the bedridden comes from the mouth.

The record. Yoneyama and colleagues randomised 417 residents across eleven Japanese nursing homes. Carers brushed residents' teeth after every meal, with professional cleaning weekly. Pneumonia occurred in 11 per cent of that group against 19 per cent of controls, febrile days in 15 against 29 per cent, and deaths from pneumonia fell significantly (Yoneyama et al 2002). Note for the book: the brief places this in the Lancet. It is in the Journal of the American Geriatrics Society, 2002, 50(3):430 to 433 [VERIFY: a short Lancet correspondence item by the same group exists, which I did not read]. A later meta-analysis in non-ventilated patients found pneumonia risk ratio 0.61 (0.40 to 0.91) on four trials (abstract), and the library's pneumonia report reaches the same place from the geriatric dentistry literature (van der Maarel-Wierink et al 2013, THRIVING library, IN-03).

The inference. A number needed to treat of about 12 to prevent one pneumonia over the study period [VERIFY: my arithmetic from 19 and 11 per cent], using a brush, water and time. Nothing else here has that ratio of effect to cost. If a village can do one thing for its bedridden, it is clean mouths after meals.

1.6 Bladder, bowel and skin

Bowel. Severe constipation affects something near 70 per cent of institutionalised elderly people, and faecal impaction is common in the bedridden (reviews read as summaries) [VERIFY: the 70 per cent figure comes from a review read only in summary]. The end of the road is stercoral colitis and perforation, with reported mortality of 30 to 60 per cent in case series that report only the worst. For a village the bowel must be a charted item, not a question anyone is too embarrassed to ask, and enemas and manual evacuation are the treatment once stool is a rock. The Red Cross enema quantities are in Protocol 5 (Delano and Strong 1918, chapter X).

Bladder. Retention is painful, invisible and common in the immobile, the confused and anyone given an opiate. A catheter solves it and starts a different clock. Bacteriuria accumulates at roughly 5 per cent per catheter-day, nearly everyone catheterised long term is colonised within about 20 days, and 2 to 6 per cent of those develop symptomatic infection (teaching summary citing Garibaldi et al 1982) [VERIFY: I did not read the 1982 paper]. That intermittent catheterisation infects less than an indwelling one looks weaker than guidance implies, with only three of 24 studies in one review showing a difference [VERIFY: read as a press summary, and I could not re-identify the review itself well enough to cite it]. For a village the question is not which catheter but whether anyone can make one clean enough.

Skin not under pressure. Incontinence-associated dermatitis is a separate injury and the commonest reason a stage 2 "pressure ulcer" is miscounted, which is why the staging system excludes moisture damage and skin tears from stage 2 (NPIAP staging, 2016 revision). Pressure damage needs offloading, moisture damage dryness and a barrier of fat or oil.

1.7 The harms of the bed, and the limits of "early mobilisation"

The record against bed rest. Allen, Glasziou and Del Mar searched to June 1998 and found 39 randomised trials of bed rest covering 15 conditions and 5,777 patients, 24 after a procedure and 15 as a primary treatment. No outcome

improved significantly in either set. Eight worsened significantly after procedures, including lumbar puncture and spinal anaesthesia, and nine worsened where bed rest was the treatment, including acute low back pain, labour, proteinuric hypertension, myocardial infarction and infectious hepatitis (Allen et al 1999, abstract and DARE summary, which counts nine rather than eight in the first set).

The physiology. Ten days of strict bed rest in healthy older volunteers cost 0.95 kg of lean leg mass, about 0.63 kg a week, despite diets meeting or exceeding the protein recommendation (Kortebein et al 2007, in a later review), plus 13.2 per cent of knee extensor strength, 14 per cent of stair-climbing power and 12 per cent of aerobic capacity (Kortebein et al 2008, secondary summaries). Contractures follow: in long-term care upper-limb contracture rose from 29.8 to 36.5 per cent and lower-limb from 41.5 to 57.4 over five years [VERIFY: cohort read as a review summary].

The limit. Passive range-of-motion exercise, the standard nursing answer, is unproven: the Cochrane review found it unclear whether passive movements treat or prevent contracture, very low certainty throughout (Harvey et al, CD009331, abstract and summaries). Active stretching does better.

The counter-example. AVERT randomised 2,104 stroke patients in 56 units to very early, higher-dose mobilisation within 24 hours or usual care. Favourable outcome at three months was less common with early mobilisation, 480 (46 per cent) against 525 (50 per cent), adjusted odds ratio 0.73 (0.59 to 0.90), p equals 0.004 (Bernhardt et al 2015). The rule is: out of bed as the illness allows, not as soon as hands are free.

Delirium. The Hospital Elder Life Program randomised 852 patients aged 70 and over against six modifiable risks: cognitive impairment, sleep deprivation, immobility, poor sight, poor hearing and dehydration. Delirium occurred in 9.9 per cent against 15.0, a 40 per cent relative reduction, adherence 87 per cent (Inouye et al 1999). Number needed to treat about 20 [VERIFY: my arithmetic]. The whole intervention is orientation, a warm drink, a back rub, glasses, earwax removal, water and walking, and every item survives the Fall intact.

1.8 The pre-antibiotic nursing record: Osler's arithmetic

Typhoid at Johns Hopkins. Osler reported 229 typhoid cases treated in the medical wards to 15 May 1893, with 22 deaths, 9.6 per cent, which he called a little lower than is common in general hospitals. After the cold bath was introduced it was 7.1 per cent (Osler 1893, read through secondary quotation) [VERIFY: I could not open the original, only quotations of it]. His Studies in Typhoid Fever fill five of the ten chapters of Johns Hopkins Hospital Reports volume V, 1895. The regimen a contemporary review quotes is a bath at 65 to 70 degrees Fahrenheit every third hour whenever the rectal temperature reached 102.5.

His own decomposition. Osler estimated that about 75 per cent of typhoid cases would recover under any treatment, that good nursing, diet and the abandonment of drugging would save another 15 per cent, and that the cold bath added three or four lives in the hundred, later raised to six to eight (secondary accounts of his Hopkins work) [VERIFY: the 75 and 15 per cent figures come from a secondary summary and I could not reach the primary]. If roughly right, it is the most important number in the nursing domain: nursing and the removal of harmful drugs were worth three to five times the era's most celebrated active treatment.

The bath is contested. Ernst Brand of Stettin reported 19,000 cases and claimed cold bathing cut a usual mortality of 16 to 20 per cent to 4 to 8 (Brand 1887, bibliographic record and quotations). German sceptics produced contradictory series: Glaser 7 per cent expectant against 8 with the water treatment, Ebstein 5.5 per cent expectant. Reviewers concluded the baths gave no better results than expectant care, and the method fell into disuse [VERIFY: from a search summary, not the journals]. The nursing half nobody disputed.

Context. Untreated typhoid killed about 15 per cent, 10 to 20 commonly quoted, and chloramphenicol from 1948 took it toward 1 (historical commentary and WHO-derived summaries, read as search results). Osler's wards, with nursing and no drug, ran at 7 to 10 per cent. That is the shape of the nursing effect: roughly a third to a half of

untreated mortality, in a disease lasting three to four weeks where everything depends on fluid, feeding, cleanliness and the recognition of perforation.

Pneumonia, for comparison. In pooled historical-control series 38 per cent of untreated patients died against 12 per cent treated with sulfonamide or penicillin, and in concurrently controlled studies 23 against 7 (Spellberg et al 2008, in THRIVING library, IN-03). Osler held lobar pneumonia to be self-limited and uninfluenced by medicine, everything the nurse did being aimed at carrying the patient alive to the crisis on day five to ten. The rule: nursing buys most where the illness is long and death comes by attrition, least where it is short and death comes from the organism.

1918, and the carer as vector. A 2025 case study of Durham, North Carolina, states that nursing care was the best treatment available for the 1918 influenza, crediting Durham's relatively good outcome partly to care organised by Black nurses from Lincoln Hospital during a national nursing shortage [VERIFY: read as abstract and summary]. No study found puts nurses per head against influenza mortality across cities. Illness mortality among United States military nurses in 1918 was 1.05 per cent, against 0.68 for United States medical officers and 0.12 for British nurses (Shanks et al 2011, abstract). The nurse is exposed and is also the bridge between patients. HY-01 holds the answer: soap removes about 2.3 to 2.5 log of bacteria against 1.2 to 1.5 for water alone, alcohol rub about 3.1 (THRIVING library, HY-01).

1.9 The modern dose-response: does more nursing mean fewer deaths

The only body of evidence that puts a number on nursing itself as a dose.

- Aiken and colleagues linked surveys of 10,184 staff nurses to 232,342 surgical discharges from 168 Pennsylvania hospitals in 1998 and 1999. Each additional patient per nurse carried a 7 per cent increase in the odds of death within 30 days, odds ratio 1.07 (1.03 to 1.12), and the same for failure to rescue (Aiken et al 2002).
- RN4CAST repeated it across 422,730 surgical patients aged 50 and over in 300 hospitals in nine European countries, with surveys of 26,516 nurses. Each extra patient per nurse carried odds ratio 1.068 (1.031 to 1.106), and every 10 per cent increase in the proportion of nurses holding a bachelor's degree carried 0.929 (0.886 to 0.973) (Aiken et al 2014).
- Needleman and colleagues moved the exposure to the shift. Across 197,961 admissions and 176,696 eight-hour shifts in 43 units of one academic centre, each shift in which nurse staffing fell 8 hours or more below target carried hazard ratio 1.02 (1.01 to 1.03), and each high-turnover shift 1.04 (1.02 to 1.06), staffing being within 8 hours of target on 84 per cent of shifts (Needleman et al 2011).

What this does and does not show. All three are observational. A 2019 systematic review of 44 studies found 39 cross-sectional and concluded that longitudinal work is needed to corroborate the associations. An earlier meta-analysis warned that estimates must be tempered by hospital characteristics including commitment to quality, the confounder one would expect: good hospitals hire more nurses and do everything else better. Needleman's shift-level design answers part of that and its single-centre scope reopens another. What transfers to a village is the shape, not the number. Nursing behaves like a dose, the response is shallow, and the part of the curve where the carer is absent appears nowhere, because no hospital runs it.

1.10 The chart, the hours, and who pays them

The chart. Nightingale's chapter on observation is a chart specification. Replace "Is he better?" with countable questions: how many hours' sleep and at which hours of the night, and food estimated by eye in ounces, recorded as "took about an oz. of his meat to day" (Nightingale 1860, chapter XIII). The 1918 manual adds the vital signs, with the technique and the normal range for each by mouth, rectum and axilla and by age (Delano and Strong 1918, chapter IV). Those figures are in Protocol 2 rather than here.

The hours. No study found measures the hours required to nurse one bedridden person well. Three indirect estimates bracket it. The 2001 United States federal staffing study concluded that 4.1 nurse-staffing hours per resident day were needed to prevent avoidable harm in a nursing home, split roughly 0.75 registered nurse, 0.55 licensed practical nurse and 2.38 aide, against an American average of 3.68, with more than 70 per cent of homes below 4.1 (CMS 2001, advocacy summaries) [VERIFY: I did not read the federal report]. A European time-diary study recorded carers of elderly people with dementia at about 38 hours a week against 16 for those without [VERIFY]. An American analysis found people over 70 with normal cognition received 4.6 hours of informal care a week, severe dementia adding 41.5 [VERIFY]. Together they put a fully dependent person at four to eight hours of hands-on attention a day, broken by two or three night wakings. My working figure, as an inference and not a measurement, is six hours of direct care plus two of laundry, cooking and fetching, one adult's working day, which no one person can hold for more than a few weeks [VERIFY: my estimate].

What it costs the carer. Schulz and Beach followed 392 spousal caregivers and 427 non-caregivers aged 66 to 96 for an average of 4.5 years. Caregivers reporting strain had 63 per cent higher mortality than non-caregivers after adjustment for sociodemographic factors and physical health, while caregivers without strain did not (Schulz and Beach 1999, abstract and secondary summaries). A book that tells a village to nurse its sick at home must also tell it to roster the nursing, because an unrostered carer is a second patient on a four-year delay.

2. Evidence grades

Practice	Tradition says	Record shows	Grade
Mouth care after meals	Prevents chest trouble	Pneumonia 11 vs 19 per cent, 417 residents (Yoneyama 2002), pooled RR 0.61	A
Upright feeding, small mouthfuls	Prevents choking	Screening meta-analysis OR 0.60, mechanism certain, protocol untrialled	B
Repositioning at all	Prevents bedsores	Mechanism certain (Kosiak 1961), no trial against no turning	B
A specific interval, 2 vs 3 vs 4 hourly	Two-hourly is law	No difference, 1,074 participants, very low certainty (Gillespie 2020)	D
Four-hourly on a redistributing surface	Not traditional	3.0 vs 14.3 to 24.1 per cent, 838 patients (Defloor 2005)	B
30 degree tilt, three-hourly at night	Not traditional	3 vs 11 per cent, 213 patients (Moore 2011), pooled estimate uncertain	C
Sheepskin overlay	Comfort	9.6 vs 16.6 per cent, 441 patients, open label (Jolley 2004)	B
Daily check of seven points	Nightingale's dictum	No trial, mechanism and staging certain	C

Practice	Tradition says	Record shows	Grade
Braden or Norton scoring	Finds the at-risk	AUC 0.55 to 0.56, no effect on incidence (Moore and Patton 2019)	D
Supplements to prevent ulcers	Feeds the skin	RR 0.92 (0.71 to 1.19), low certainty (Langer 2024)	D
Multicomponent delirium prevention	Keeps them oriented	9.9 vs 15.0 per cent, 852 patients (Inouye 1999)	A
Avoiding unnecessary bed rest	Rest cures	39 trials, none improved, several worsened (Allen 1999)	A
Hard mobilisation within 24 h of stroke	Get them up	Worse outcome, OR 0.73, 2,104 patients (Bernhardt 2015)	X
Passive range of motion	Keeps joints free	Unclear, very low certainty (CD009331)	D
Nursing in pre-antibiotic typhoid	Nursing is the cure	7.1 to 9.6 per cent against 15 per cent background (Osler)	B
The cold bath for typhoid	Halves mortality	Brand claims 16 to 20 down to 4 to 8, German series show none	D
Higher nurse staffing	Fewer deaths	OR 1.07 per extra patient, three large observational studies	B
Tube feeding in advanced dementia	Prevents aspiration	No RCT, no benefit, possible harm (Finucane 1999)	X
Hand hygiene by the carer	See HY-01	2.3 to 2.5 log removal with soap	A

3. Means ledger

Rung	What it can do	What it changes
Hands and knowledge alone	Turn, sit upright to feed, clean the mouth with a finger and cloth, check seven points daily, keep the bowel moving, orient and talk, count pulse and breaths	Most of the total effect. Prevents aspiration, pressure injury and delirium, treats no underlying illness
The hearth	Bed bath at 105°F, boiled water, clean linen daily, soap for the carer's hands, honey or sugar on a broken ulcer (WO-02), enema, spoon feeding every 2 to 3 hours, wrapped hot stones	Turns prevention into treatment. A stage 2 ulcer heals here, and the scald risk begins here

Rung	What it can do	What it changes
Garden and still	Alcohol rub for pressure points, made soap, a sheepskin or chaff overlay, a proper bed 6ft6in by 36in at 24 to 26in, a draw sheet, a bedpan, a salvaged thermometer	One carer can move a heavy patient without injuring either. Sheepskin halves ulcer incidence, and the bed is the biggest capital item
Village dispensary (300)	A chart per patient, a rota, a trained person who checks sores and mouths weekly, a catheter if one can be kept clean, teaching for families	Household competence becomes a standard, and the rota is the intervention
District infirmary (3,000)	Ten beds for those no household can manage, night cover, surgery for stage 4 ulcers, isolation of the infectious	Gains the family-less and the surgical ulcer, loses the home's hygiene advantage and gains cross-infection. The lying-in figures are the warning
Hospital before the Fall	Redistributing mattresses, enteral feeding, suction, antibiotics, imaging, 4.1 staffing hours per resident day	Adds antibiotics and suction. Adds nothing to the mouth, the position, the turn or the chart

The honest reading is unusual in this series: nursing is the one domain where the household rung holds most of the effect and the hospital rung adds least.

4. Harm test

Aspiration. The commonest fatal nursing error. Caused by feeding a drowsy, confused or flat patient, by large mouthfuls, by hurrying, by thin fluids in someone who coughs on them, and by giving a swallow while the patient inhales. Signs: coughing or a wet gurgling voice at or after every swallow, a change in breathing during the meal, fever and fast breathing 12 to 48 hours later. What to do: stop feeding, sit them fully upright, clear the mouth, do not try to make them drink. Never feed anyone who cannot be woken enough to hold their head up. Historical case: the tube-fed, among whom aspiration occurred in up to half despite the tube (Finucane et al 1999).

Scalds and burns. A United Kingdom burns unit saw 85 hot-water-bottle injuries between 2004 and 2013, 39 of them children, averaging about 3 per cent of body surface, 48.2 per cent from rupture, 33 per cent from spilling and 18.8 per cent from contact (Baker et al 2013, abstract and summaries). A pooled review of ten studies and 1,343 patients found 15 to 87.4 per cent needed surgery, and an Australian coronial inquiry followed the death of an elderly woman scalded by one in a nursing home. Who must never receive one: anyone who cannot feel the heat or move away, which is every bedridden person, every paralysed limb and every confused person. Rule: never against skin, wrapped in two layers of cloth, never under a patient, removed before sleep.

Pressure injury from the care itself. Dragging a patient up the bed rather than lifting strips skin, and a hard inflated ring makes a ring of ischaemia, which is why the 1918 text says to inflate it only enough to lift the area off the bed (Delano and Strong 1918). Signs: a new rim of redness matching the ring or a sheet fold, a skin tear after a move.

Cross-infection carried by the carer. The carer who moves from the person with diarrhoea to the person with the pressure sore, unwashed, is the vector. The failure is washing between tasks but not between patients. HY-01 has the numbers and the protocol.

Starvation by protocol. Restricting feeding after a failed swallow screen carried adjusted odds of pneumonia of

4.06 (1.72 to 9.54) in HeadPoST. A screen that leads to nil by mouth with no alternative is a harm, not a precaution.

Over-turning and sleep deprivation. No trial measured it, a gap the Cochrane reviewers note. Waking a frail old person every two hours all night is a plausible cause of delirium, the one condition here with grade A prevention evidence. The inference, stated as an inference: on a good surface, turn four-hourly at night and let them sleep [VERIFY: my judgement from Defloor 2005, Bergstrom 2013 and Inouye 1999].

Immobilisation as comfort, and its opposite. Bed rest as a treatment harms, and so does hard mobilisation within 24 hours of a stroke. Section 1.7 has both.

Faecal impaction from inattention. Opiates, dehydration, immobility and embarrassment combine, and the end is perforation and death. Signs: no stool for three days with distension, overflow liquid stool mistaken for diarrhoea, confusion, vomiting.

The carer. Strained caregivers had 63 per cent higher four-year mortality than non-caregivers (Schulz and Beach 1999). An exhausted carer makes the aspiration error, so this belongs in the harm test, not a footnote.

5. Red flags

Each of these means death or disability without what the village cannot give, and each is paired with what to do anyway.

1. **Cannot swallow their own saliva, or coughs on every sip.** Without suction and tube feeding this is an end-of-life situation. Do anyway: sit them fully upright, give only what they can manage, keep the mouth moist and clean with a damp cloth every hour, tell the family plainly.
2. **A black or deep purple patch over sacrum or heel that does not blanch.** Deep tissue injury, dead muscle under intact skin, which will open into a stage 4 ulcer. Do anyway: offload completely, never massage it, never remove stable dry eschar from a heel, keep it dry.
3. **An ulcer with exposed bone, with fever and a fast pulse.** Osteomyelitis or sepsis, needing surgery and antibiotics. Do anyway: honey or sugar packing (THRIVING library, WO-02), clean dressings, fluids, pain relief, and prepare the family.
4. **No urine for 12 hours with a tense, tender lower abdomen.** Retention. Without a catheter the bladder rises and the kidneys fail. Do anyway: sit them up, warm water over the perineum, the sound of running water, gentle pressure above the pubis, and find anyone who can pass a catheter.
5. **No stool for five days with distension and vomiting.** Impaction moving to obstruction. Do anyway: enema, then manual evacuation with a gloved, washed and greased finger, unpleasant and lifesaving.
6. **New confusion with fever or fast breathing.** Usually pneumonia, urinary infection or impaction, each needing a drug the village may not have. Do anyway: look for the three in that order, fluids, upright, clean mouth, quiet at night, light by day.
7. **A carer who has not slept for three nights.** The patient is now in more danger from the carer than from the disease. Do anyway: force a rota, any rota.

6. The case against

The staffing literature cannot bear the weight put on it. Of 44 studies in a 2019 systematic review, 39 were cross-sectional, and the meta-analytic estimate is described as not necessarily causal. Hospitals that hire nurses also buy mattresses, write protocols and employ better surgeons. A 7 per cent change in odds, from between-hospital comparisons in rich countries, is a thin plank for "nursing is the main medicine".

The repositioning evidence is, at best, absent. The two-hourly tradition rests on one 1961 study whose critics say the pressure-time curve is not justified. The Cochrane verdict is very low certainty throughout, and Bergstrom

found no difference between two, three and four-hourly on a decent mattress. A sceptic can say the active ingredient is the surface and the nurse's labour largely ritual, and the trials cannot refute him.

The pre-antibiotic series are not populations. Osler noted the selection himself: hospital series exclude those who died before admission and those too poor to come, and his pneumonia mortality fell to about ten per cent once the old and debilitated were excluded (Osler 1892, in THRIVING library, IN-03). A ward with devoted nursing and 7 per cent typhoid mortality may have had a better class of typhoid.

The Nightingale legend is a liability. McDonald, her defender, places the turning point at the Sanitary Commission of March 1855. Small, her sharpest critic, shows 36 per cent deaths among men sent to Scutari against 13 per cent among those who stayed. They agree that nursing is not what moved the numbers. A chapter that leads with Scutari builds on the one case where the thesis fails.

The named critics. Hugh Small (1998, 2020) against the legend. Lynn McDonald against Small and, incidentally, against the nursing-did-it story. The Cochrane wounds group, through Gillespie and colleagues (2020) and Moore and Patton (2019), against the repositioning and risk-scoring orthodoxies. The 2019 PLOS ONE reviewers against causal readings of Aiken. Finucane and colleagues (1999) against the feeding tube, the one case against a technology that favours the nurse.

The counter-argument that saves the thesis. None of this touches claim three. In a village with no antibiotic, no mattress, no suction and no surgery, the counterfactual is not less nursing against more but nursing against nothing, and nobody has run that trial because nobody would. The honest formulation is not "nursing is the main medicine" but "nursing is the only medicine that survives the Fall intact, and the evidence that it is worth doing well is weaker than the evidence that it is worth doing".

7. Ten-line summary of robust findings

1. The fall in Scutari mortality from about 43 per cent in February 1855 followed the Sanitary Commission of March 1855. Drains, ventilation and crowding did it, not nursing.
2. Scutari ran at 11.9 per cent deaths over admissions across the war, Koulali at 25.9 and Renkioi at 3.8, so it was not the worst hospital in the theatre.
3. Of men sent on to Scutari, 36 per cent died against 13 per cent of those who stayed in the Crimea, a gap selection explains to an unknown degree.
4. Mouth care after meals cut pneumonia from 19 to 11 per cent in 417 randomised nursing-home residents, the best effect-to-cost ratio in this report.
5. Multicomponent delirium prevention cut delirium from 15.0 to 9.9 per cent in 852 patients, using orientation, sleep, mobility, glasses, hearing and water.
6. No trial shows two-hourly turning beats four-hourly. Four-hourly on a pressure-redistributing surface gave 3.0 per cent grade II ulcers against 14.3 to 24.1 on other regimens.
7. Sheepskin halved pressure-ulcer incidence, 9.6 against 16.6 per cent in 441 patients, in an unblinded trial.
8. Bed rest as a treatment has never improved an outcome across 39 randomised trials and worsened several, yet very early aggressive mobilisation after stroke also worsened outcomes.
9. Osler estimated that 75 per cent of typhoid patients recovered whatever was done, that nursing, diet and stopping the drugs saved another 15, and the cold bath 3 to 8.
10. Each extra patient per nurse carried about 7 per cent higher odds of surgical death in two large observational studies on two continents, an association probably real and certainly confounded.

8. Open questions

- Nobody has measured the hours of care a bedridden person needs, as against the hours institutions supply. The 4.1 hours per resident day standard is administrative, not measured.

- Does turning at night cost more in delirium and lost sleep than it saves in skin? No trial recorded sleep, pain on repositioning or quality of life.
- Is the effective ingredient in repositioning the movement or the surface? Defloor and Bergstrom point to the surface, and no trial has separated them cleanly.
- What is the simplest surface a village can make that performs like viscoelastic foam? Sheepskin is the only tested low-technology option, in an unblinded trial.
- What is the true mortality effect of nursing where there are no drugs? The only estimate is Osler's 15 per cent, which I could not trace to a primary source.
- Does mouth care work in a household, or only where a hygienist visits weekly as in the Yoneyama trial?
- Did nurse availability change 1918 influenza mortality between towns? The data sit in city health reports and nobody appears to have joined them.

9. The sources to read in full

1. Nightingale, Notes on Nursing (1860), chapters I, VI, VIII and XIII. Free, short, still the best specification of a chart, a bed and a meal.
2. Delano and Strong, American Red Cross Text-Book on Home Hygiene and Care of the Sick (1918). Free on Project Gutenberg, and the book this chapter is trying to write, already written for a household with no trained nurse.
3. Gillespie et al, Cochrane CD009958.pub3 (2020), repositioning, for how little is known.
4. Defloor, de Bacquer and Grypdonck (2005), the one large trial that changes practice.
5. Yoneyama et al (2002), four pages, the best return on effort in the nursing literature.
6. Allen, Glasziou and Del Mar (1999), Lancet, on bed rest.
7. Aiken et al (2014), RN4CAST, with the 2019 PLOS ONE review beside it as the corrective.
8. McDonald's Scutari papers and Small's 2020 Significance table, read against each other.
9. Finucane, Christmas and Travis (1999), JAMA, on feeding tubes in advanced dementia.
10. Inouye et al (1999), NEJM, a prevention programme made entirely of attention.

10. At the bedside after the Fall

The household. One bedridden person needs one named carer and one named relief, a bed reachable from both sides, and the day set out in Protocol 1. To start: a bed at about knee height, two sheets and a draw sheet, a sheepskin or deep chaff pallet, soap, a basin, a cloth, a brush or frayed twig for the mouth, a spoon, a cup, a bedpan, and a slate. The first failure to expect is the carer, not the patient. The second is a sacral ulcer in the second week, because the first week's vigilance does not survive exhaustion.

The village of 300. At any time such a village will have perhaps three to six people needing full bedside care, more after an epidemic or a harvest injury [VERIFY: my estimate from nursing-home dependency rates]. What it adds is a rota and a standard: one trained lay nurse who visits every bedridden person twice a week, inspects skin and mouth, reads the chart and teaches, plus clean cloth, soap, sheepskins, and a register of who is bedridden and who nurses them. The first failure is that nobody reads the chart.

The district of 3,000. Ten beds for those no household can manage, the family-less, the violently confused and the surgically sick, the night cover a household cannot provide, and a school for carers that teaches Protocol 1 and tests it. The first failure to expect is cross-infection, which is why Nightingale's lying-in figures of 34 deaths per 1,000 against 5.1 at home belong on that building's wall.

11. Protocols

Protocol 1. One day's care of one bedridden person, by a family

Before first light to breakfast. 1. Wash hands with soap for at least 20 seconds before touching the patient, after every bedpan and before every meal (THRIVING library, HY-01). 2. Greet by name, say the day and the time. This is the delirium protocol, and it costs nothing. 3. Offer the bedpan or urinal first. Warm it with hot water and dry the outside. Lift the hips to remove it rather than dragging. 4. Wash face and hands, clean the mouth, comb the hair, straighten the bed. 5. Give the first food as soon as they wake. Sit them fully upright, feed slowly, spoon at right angles to the lips, pause between mouthfuls, never give a swallow as they breathe in. Keep them upright for 30 minutes after.

Mid-morning. 6. An hour after breakfast, the wash. Room about 20°C, basin at about 40°C (105°F). Wash and dry in this order: face, neck, ears, arms, hands, chest, abdomen, then turn for back, buttocks and thighs, then legs and feet, genitals last. Dry each part before washing the next and keep the rest covered. 7. During the back wash, inspect and record the seven points: back of head, shoulder blades, elbows, sacrum, hips, heels, ankle bones. Press any red area for three seconds. If it goes white and returns, the pressure is relieving. If it stays red, it is stage 1 and that area carries no weight from now on. 8. Change the bottom sheet if cloth allows, dirty or not, and smooth every fold. A fold under a sacrum is a wound in three days.

Through the day. 9. Turn or shift the weight every 3 to 4 hours on a sheepskin or deep pallet, every 2 hours on a hard bed. Use the 30 degree tilt rather than rolling onto the hip: pillows behind the back and between knees and ankles, heels clear of the bed. 10. Feed 6 to 8 ounces of liquid food every 2 to 3 hours if they cannot take meals, or three meals and two snacks if they can. Water freely between. 11. Clean the mouth after every meal: teeth, gums, tongue and the inside of the cheeks. This is the highest-value act in the protocol. 12. Twice a day move every joint gently through its full range, five times each: shoulders, elbows, wrists, fingers, hips, knees, ankles. The evidence is weak, but nothing else is on offer. 13. Sit them out of bed if the illness allows, starting with minutes and building. Not at high intensity within 24 hours of a stroke. 14. Open the window once or twice a day until the air has changed, the patient covered and out of the draught. NU-03 has the sickroom.

Evening and night. 15. Wash face and hands, change the shirt, shake the pillows, clean the mouth, offer the bedpan, give a hot drink, dim the light. 16. Turn once or twice in the night, not every two hours, if the surface is good. Protect sleep. 17. Never put a hot water bottle or hot stone against skin. Two layers of cloth, never under the patient, removed before sleep.

Protocol 2. The chart, kept by hand

One line a day on a slate, one page a week on paper. Record only what can be counted.

- Date.
- Temperature if a thermometer exists, and the time taken. Mouth two minutes, normal 98.6°F (37.0°C), fever above 99.5°F (37.5°C). Rectal half a degree higher, three minutes. Axilla half a degree lower, five minutes.
- Pulse, counted for 30 seconds and doubled, with the two half-minute counts agreeing within two beats. Adult man about 72, adult woman about 80.
- Breaths, counted for a full minute without the patient knowing. Adult 16 to 20.
- Food taken, estimated in ounces or spoonfuls. "Four ounces of broth, three times."
- Water taken.
- Urine: passed or not, and roughly how much.
- Stool: passed or not. Mark a cross on any day with none. Three crosses in a row is an action, not a note.
- Skin: the seven points, each marked clear, red, or broken with its size in finger-widths.
- Sleep: hours, and at which hours of the night.
- Mind: oriented, muddled, or not rousable.

- Anything new.

Protocol 3. Preventing and finding a pressure injury

1. Inspect the seven points once a day in good light, by hand as well as eye. On dark skin colour is unreliable: feel for an area warmer, cooler, firmer or boggier than the skin beside it, and ask about pain.
2. Blanch test: press three seconds. Redness that does not blanch is stage 1.
3. Stage 1, redness that stays: take all weight off that point permanently, check every four hours, expect it to settle in one to three days.
4. Stage 2, a shallow open sore or blister with a pink moist base: clean with clean water, cover, keep it dry of urine and faeces, offload completely. Do not confuse it with moisture damage, which is wet, diffuse and in the folds, not over a bone.
5. Stage 3, a crater with visible fat: use the wound protocols in WO-02, sugar or honey packing changed once or twice a day while wet.
6. Stage 4, bone or tendon visible: a red flag. Treat the patient and warn the family.
7. Deep purple or black under intact skin: deep tissue injury. Offload, do not massage, do not open, do not remove stable dry eschar from a heel.
8. Never rub a red area hard. Never use a hard inflated ring.

Protocol 4. Feeding a person who is losing their swallow

1. Test before every meal, not once. Give three teaspoons of water, one at a time, sitting fully upright. Watch for coughing, a wet or gurgling voice afterwards, or a change in breathing.
2. If they cough on all three, give nothing thin by mouth this meal. Try thickened food: porridge, mashed root, soft egg. Soft and moist is safer than thin and runny.
3. Upright at 90 degrees if they can hold it, never flat, never with the chin tipped up.
4. Half a teaspoon at a time. Wait until the previous mouthful has gone and watch the throat move.
5. Stop at the first sign of tiring. A tired swallow is an unsafe swallow.
6. Upright for 30 minutes after, then clean the mouth at once. That is where the pneumonia comes from.
7. Never feed anyone who cannot be woken enough to sit up and hold their own head.
8. If they cannot take enough by mouth over several days, they are dying. Say so, keep the mouth wet and clean, and do not let the family believe a stronger person could have made them eat.

Protocol 5. The bowel and the bladder

1. Chart stool daily.
2. Two days without stool: a glass of water or fruit juice an hour before breakfast, more fluid through the day, sit them up or out of bed, gentle clockwise massage of the belly.
3. Three days: an enema. Warm soapy or salty water at 105 to 110°F (40 to 43°C), 2 to 4 pints for an adult, 1 to 2 pints for a child, 2 to 3 ounces up to half a pint for a baby. Run it in slowly with the patient on the left side.
4. Five days with distension, vomiting, or liquid stool leaking past a blockage: manual evacuation. Wash and grease a gloved or clean finger, enter gently, break up and remove the hard mass in pieces. Stop for bleeding or severe pain.
5. Chart urine. No urine for 12 hours with a tense, tender swelling above the pubic bone is retention. Sit them up, pour warm water over the perineum, run water where they can hear it, press gently above the pubis. If nothing comes, this is a red flag.
6. A catheter starts a clock. Keep the bag below the bladder, never disconnect it, remove it as soon as they can pass urine without it.

Protocol 6. The carer's rota

1. No one nurses a fully dependent patient alone for more than seven days.
2. Name two carers and one reserve before the first night, not after the first crisis.
3. Split the day into three: morning, afternoon, evening and night. No one holds all three more than two days running.
4. Write the rota where the household can see it. The patient should know who is coming and when.
5. The carer eats and sleeps first. A carer who has not slept three nights is the main danger in the room.

12. Numbers to carry

1. **Seven points.** Head, shoulder blades, elbows, sacrum, hips, heels, ankles, looked at and touched once a day.
2. **Three seconds.** The blanch test. Redness that does not go white is stage 1, and that point carries no weight again.
3. **Two to four hours.** Turn two-hourly on a hard bed, four-hourly on a good surface. No trial shows two beats four. Protect sleep.
4. **19 to 11.** Pneumonia per cent in nursing-home residents without and with mouth care after meals.
5. **6 to 8 ounces every 2 to 3 hours.** The liquid-diet ration, half a teaspoon at a time if the swallow is failing.
6. **30 minutes upright after every meal.** The aspiration rule.
7. **75, 15, 3 to 8.** Osler's typhoid arithmetic: three-quarters recover whatever is done, nursing and stopping the drugs save another fifteen in a hundred, the famous treatment three to eight.
8. **15 per cent.** Untreated typhoid mortality. Osler's nursed wards ran at 7 to 10.
9. **Six to eight hours a day.** What one fully dependent person costs. Two carers and a reserve, or the carer becomes a patient.
10. **63 per cent.** The extra four-year mortality of a strained family carer. The rota is a treatment.

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