IN-04 Sepsis: recognising the dying infection and what helps without an ICU

HEALING after the FALL, research library, IN-04

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

Scope. This report covers the moment an infection stops being local and starts to kill: how to see it with hands and eyes, what it did before antibiotics, and which modern sepsis rules survive without a laboratory or intensive care unit. It builds on the library's reports on examination (THRIVING library, FO-07), the great killers (THRIVING library, IN-01), handwashing (THRIVING library, HY-01), rehydration (THRIVING library, HY-03), infected wounds (THRIVING library, WO-14) and pneumonia (THRIVING library, IN-03, which appeared during this work and may not be final). The related reports IN-05 (antibiotics), MA-04 (maternity) and NU-02 (nursing) do not exist in the library, so their ground is covered only as far as sepsis needs it. Where only an abstract or secondary summary was read, the reference says so. [VERIFY] marks a claim I could not confirm or my own inference.

1. Findings by section

1.1 What sepsis is, and why it kills

The 2016 international definition calls sepsis "life-threatening organ dysfunction caused by a dysregulated host response to infection" (Singer et al 2016). The infection may start in the lung, urine, womb, a wound, the gut, the skin or a newborn's cord. Sepsis is the stage at which the body's reaction damages organs far from the source. In hospital terms a two-point rise on the organ-failure score (SOFA) carries a mortality above 10 per cent. Septic shock, in which drugs are needed to hold blood pressure and lactate stays above 2 mmol/L despite fluid, carries a mortality above 40 per cent (Singer et al 2016).

The idea matters more than the definition. Sepsis is a state, not a germ. The pneumococcus that gives one man a cough puts his neighbour into shock. What kills is failure of circulation, breathing, kidneys, brain and clotting, so the signs that matter are those of failing organs: confusion, fast breathing, a weak pulse, cold mottled skin, little urine.

The burden is large and mostly poor. An estimated 48.9 million cases and 11.0 million deaths occurred in 2017, 19.7 per cent of all deaths worldwide, about 85 per cent of cases in low- and middle-income countries and over 40 per cent in children under five (Rudd et al 2020, secondary summary). The WHO maternal infection study in 713 facilities in 52 countries found infection-related severe maternal outcomes in about 11 of every 1,000 live births (GLOSS Research Group 2020, secondary summary). Dünser and colleagues, who wrote the first sepsis recommendations for resource-limited settings, later put over 80 per cent of sepsis deaths in such settings (Dünser et al 2012, Dondorp et al 2019, neither read in full) [VERIFY].

After the Fall every community is a resource-limited setting. This report sorts what intensive care learned into what transfers to a cottage, what transfers only to an infirmary, and what is dangerous outside a hospital.

1.2 Recognising sepsis: the bedside scores

Record. Seymour and colleagues built the quick SOFA score (qSOFA) from electronic records: breathing 22 or more a minute, altered mentation, and systolic pressure of 100 mmHg or less (Singer et al 2016). Among 66,522 patients outside intensive care with suspected infection, of whom 3 per cent died, qSOFA predicted death as well as the full SOFA score (area under the curve 0.81 against 0.79) and better than the older SIRS criteria (0.76). Two or more points meant a three- to fourteen-fold rise in mortality (Seymour et al 2016, abstract and secondary summary). Makam and Nguyen objected in JAMA that such differences in the area under the curve say little about usefulness at the bedside (Seymour et al 2016, secondary summary of the correspondence).

Later reviews agree that qSOFA is specific but misses many. Fernando and colleagues pooled 38 studies and 385,333 patients: for death, qSOFA had sensitivity 60.8 per cent and specificity 72.0 per cent, and outside intensive care 51.2 and 79.6 per cent, against 88.1 and 25.8 per cent for SIRS (Fernando et al 2018, secondary summary). Song and colleagues, with 23 studies and 146,551 patients, found 0.51 and 0.83 for qSOFA and 0.86 and 0.29 for SIRS (Song et al 2018). **qSOFA catches about half of those who will die, and when it fires it means business.** The 2021 Surviving Sepsis Campaign recommends against qSOFA alone as a screening tool (Evans et al 2021).

Poor countries. In 6,569 adults in 17 hospitals in 10 low- and middle-income countries, patients with a high qSOFA died at 19 per cent against 6 per cent, an odds ratio of 3.6, but performance varied between cohorts (Rudd et al 2018, secondary summary). A circulating figure of 0.70 for its area under the curve I could not confirm [VERIFY]. The Universal Vital Assessment (UVA) score, derived in African hospitals, adds temperature, heart rate, oxygen saturation and HIV status. It reached 0.77 against 0.70 for the Modified Early Warning Score and 0.69 for qSOFA (Moore et al 2017), 0.82 against 0.68 in 2,797 febrile adults in Africa and Asia (Lal et al, secondary summary), and 0.77 against 0.66 in 573 Rwandan adults, 7 per cent of whom died (Rwanda UVA study). The Rwandan paper scores: voice only 1, pain only 2, unresponsive 3 [VERIFY against Moore], systolic under 90 mmHg 1, breathing 30 or more 1, heart rate 120 or more 1, temperature under 36°C 2, oxygen saturation under 92 per cent 2, HIV positive 2. Totals of 0 to 1, 2 to 4 and over 4 gave positive predictive values for death of 0.04, 0.14 and 0.35.

Pregnancy. About 15 per cent of pregnant women have a usual systolic pressure under 100 with normal outcomes. The Australian and New Zealand obstetric society therefore uses an obstetric qSOFA: systolic 90 or less, breathing 25 or more, and any state other than fully alert. It has not been validated in large populations (O&G Magazine, SOMANZ summary).

Inference. Without a cuff, qSOFA becomes three things anyone can learn in an afternoon: count breaths for a full minute, ask where they are and what day it is, and feel the wrist. A weak or absent radial pulse stands in for low pressure. But a palpable radial pulse proves little: in 20 shocked patients, 10 of 12 with all pulses present had systolic pressure below 80 (Deakin and Low 2000, via THRIVING library, FO-07). Lay breath counts agree poorly, kappa 0.41 to 0.49 in children (Baker 2019, via THRIVING library, FO-07). **The score is a trigger to act, never a reason to wait.** Grade A for prognosis, B for lay use.

1.3 Recognising sepsis: what the hands find

Rigors. Tokuda and colleagues graded chills in 526 febrile adults, 7.6 per cent of whom had bacteraemia. Shaking chills (the whole body shaking under a thick blanket) carried a risk ratio of 12.1 against none, moderate chills (needing a thick blanket) 4.1, and mild chills 1.8, not significant. Shaking chills had specificity 90.3 per cent and a positive likelihood ratio of 4.65. No chills gave a negative likelihood ratio of 0.24 (Tokuda et al 2005, abstract). **A true rigor means bacteria are probably in the blood.** Grade B.

Mottling. Ait-Oufella and colleagues scored marbling around the knee from 0 (none) to 5 (beyond the groin). In 60 patients with septic shock, 14-day mortality was 45 per cent, observer agreement was excellent (kappa 0.87), and against scores of 0 to 1 the odds ratio for death was 16 for 2 to 3 and 74 for 4 to 5 (Ait-Oufella et al 2011, secondary summary). The middle grades are usually given as a coin-sized patch at the knee (1), to the top of the kneecap (2),

mid-thigh (3) and the groin fold (4) [VERIFY]. A study of 259 patients confirmed the association with an odds ratio of 2.26 [VERIFY unit] (Dumas et al 2019). Grade B. It needs no tools. I found no study on dark skin [VERIFY].

Capillary refill. ANDROMEDA-SHOCK standardised it: press a glass slide on the pad of the right index finger until it blanches, hold 10 seconds, release and time the return of colour. Over 3 seconds is abnormal. In 424 patients in 28 intensive care units, resuscitation aimed at normal refill gave 28-day mortality of 34.9 per cent against 43.4 per cent when aimed at lactate (hazard ratio 0.75, p = 0.06), with less fluid in the first eight hours, 2,359 against 2,767 mL (Hernández et al 2019, secondary summary). Normal limits are about 2 seconds in children and men, 2.9 in women and 4.5 in the elderly, longer in the cold (Schriger and Baraff 1988, via THRIVING library, FO-07). In febrile Tanzanian children refill over 3 seconds carried an odds ratio for death of 9.0 (Clifton 2012, via THRIVING library, FO-07). **Refill is the best free test of the circulation, and a microscope slide makes it reproducible.** Grade A as a resuscitation target, B for prognosis.

Urine. In the dying, under 100 mL in 12 hours is a strong late sign (Hui 2014, via THRIVING library, FO-07). I found no lay threshold for treatable sepsis [VERIFY]. Ask when the patient last passed water and measure it in a marked jug. No urine for 12 hours in an adult who has been drinking is treated here as a red flag [VERIFY: my threshold].

The mind. New confusion, drowsiness or agitation is a qSOFA item and an IMCI danger sign (WHO 2014, via THRIVING library, FO-07). Families notice it first. "She is not herself" is a vital sign.

Fever is not required. A temperature under 36°C scores two UVA points, as many as HIV (Rwanda UVA study). Cold sepsis in the old, the newborn and the starved is the more dangerous kind [VERIFY: inference from the scoring].

1.4 Children and newborns

IMCI gives five general danger signs for children aged 2 months to 5 years: unable to drink or breastfeed, vomits everything, has had convulsions, convulsing now, lethargic or unconscious. Any one means very severe disease (WHO 2014, via THRIVING library, FO-07). Inability to drink carried an odds ratio for death of 8.9 in febrile Tanzanian children (Clifton 2012, via THRIVING library, FO-07). For infants under two months, seven signs: feeding difficulty, convulsions, movement only when stimulated, breathing 60 or more, severe chest indrawing, temperature 37.5°C or more, or below 35.5°C (Young Infants Clinical Signs Study Group 2008, via THRIVING library, FO-07). The 2005 WHO Pocket Book defines shock in a child as cold hands, capillary refill over 3 seconds and a weak, fast pulse (WHO 2005).

Possible serious bacterial infection affects about 7.6 per cent of newborns in poor regions, with case fatality 9.8 per cent (Seale 2014, via THRIVING library, IN-01). In Gadchiroli, village health workers who kept newborns warm, supported breastfeeding and treated suspected sepsis with oral co-trimoxazole and injected gentamicin cut neonatal sepsis case fatality from 16.6 to 2.8 per cent (Bang 1999, via THRIVING library, IN-01). This is the strongest evidence in the field that trained lay workers can treat sepsis at home.

1.5 The untreated record

Puerperal fever. In 1846 the doctors' First Clinic in Vienna lost 459 of 4,010 mothers (11.4 per cent) and the midwives' Second Clinic 105 of 3,754 (2.8 per cent). After handwashing, the First Clinic lost 45 of 3,556 in 1848, 1.27 per cent. The popular "18 to under 2 per cent" compares one bad month with a good year (THRIVING library, HY-01). I agree with HY-01 here, and note that IN-01 quotes the April 1847 figure of 18.3 per cent without that caveat (THRIVING library, IN-01). Handwashing prevents puerperal sepsis but does not cure it. Alexander Gordon in Aberdeen treated 77 women in the 1789 to 1792 epidemic, of whom 25 or 28 died depending on the retelling (Hektoen International) [VERIFY]. At Queen Charlotte's Hospital in London between 1931 and 1934, case fatality of haemolytic streptococcal puerperal infection ranged from 18 to 29 per cent (Colebrook and Kenny 1936).

Prontosil. Leonard Colebrook and Méave Kenny gave prontosil to 38 women with streptococcal puerperal fever in 1936. Three died (8 per cent), against 10 of the previous 38 (26.3 per cent) and 9 of the 38 before those (23.7 per cent) (Colebrook and Kenny 1936). Colebrook and Purdie's 1937 series had 8 deaths among 106 (7.5 per cent, my arithmetic) (Embryo Project). A figure of 4.7 per cent given for another series of 64 I could not reconcile with its deaths [VERIFY]. Puerperal fever deaths in England and Wales reportedly fell from 19.5 per 10,000 births in 1934 to 5.4 in 1940 and under 3 by 1944 (Embryo Project) [VERIFY]. These are historical controls during a period of falling streptococcal virulence, but the size and speed of the fall convinced contemporaries [VERIFY: Loudon's assessment not read directly].

Bacteraemia. The brief quotes untreated streptococcal bacteraemia mortality as over 70 per cent. I could not confirm that for streptococci [VERIFY]. A table of pre-antibiotic series in a modern trial protocol gives Skinner and Keefer (Boston, 1941) 100 deaths in 122 (82 per cent), Scott (1935) 49 in 60 (82 per cent) and Rosenow (1938) 19 in 29 (66 per cent) (NCT03138733 protocol) [VERIFY: probably staphylococcal]. Keefer's 1,400 erysipelas cases died at 16.4 per cent, but that is local infection. Spellberg's review of 1900 to 1950 gives 10.7 per cent untreated mortality for cellulitis and erysipelas, 2.2 per cent with sulphonamides and 0.3 per cent with penicillin (Spellberg 2009, via THRIVING library, WO-14). **Once bacteria are in the blood, untreated case fatality runs from two in three to four in five. Before that, most local infections recover.**

Pneumonia and time. Pneumococcal bacteraemia was the strongest predictor of death in untreated pneumonia, and bacteraemic patients still died at 17 per cent with penicillin (Spellberg 2008, via THRIVING library, IN-03). Klugman and colleagues found the time from onset to death in untreated pneumococcal pneumonia similar to that in the 1918 pandemic, a median of about a week to a week and a half (Klugman et al 2009) [VERIFY: my reading of the summary]. IN-03 marks these intervals unchecked, and I could not check the tables either. **Untreated sepsis usually kills over days, not hours. There is time to act, but none to waste.**

1.6 The first hour

Claim. Kumar and colleagues reviewed 2,154 adults with septic shock in 14 intensive care units from 1989 to 2004. Mortality was 56.2 per cent. Survival fell by 7.6 per cent for each hour of delay to an effective antibiotic over the first six hours (odds ratio 1.119 per hour). Only 14.5 per cent were treated within an hour, and the median delay was six hours. Survival with a drug in the first 30 minutes was 82.7 per cent. For the first hour the abstract gives 79.9 per cent and The Bottom Line's summary 77.2 per cent, a difference I could not resolve (Kumar et al 2006) [VERIFY].

Check. Kumar's study was retrospective and did not report source control. After New York State mandated sepsis bundles, data on about 49,000 patients gave an odds ratio for death of 1.04 for each hour to complete the bundle, and 1.14 for antibiotics at 3 to 12 hours rather than 0 to 3. The timing of the fluid bolus did not matter (odds ratio 1.01) (Seymour et al 2017, secondary summary). In 35,000 Kaiser patients, the odds ratio was 1.09 per hour (Liu et al 2017, abstract). Later analyses place the hourly effect mainly in patients with shock [VERIFY: author not traced].

Guideline. The 2018 Hour-1 Bundle asked for lactate, blood cultures, broad-spectrum antibiotics, 30 mL/kg of fluid for low pressure or lactate of 4 mmol/L or more, and vasopressors, within an hour (Levy et al 2018, secondary summary). The 2021 guideline keeps one hour for possible shock or probable sepsis but allows three hours for possible sepsis without shock (Evans et al 2021).

Inference. The sources agree in direction and differ in size by a factor of five or more. For the village the lesson is not to chase minutes but to avoid days. **Give the first antibiotic dose as soon as sepsis is recognised, by injection if possible, before any journey.** Grade B, strongest in shock.

1.7 Fluids: the romance and the trials

Romance. Rivers and colleagues randomised 263 patients in a Detroit emergency department to six hours of fluids, blood and drugs steered by a central venous catheter, or usual care. Mortality was 30.5 against 46.5 per cent (Rivers

et al 2001, secondary summary). Critics noted the single centre, the high control mortality and the investigator's commercial links to the catheter.

Refutation. Three large trials in the United States (ProCESS), Australasia (ARISE) and England (ProMISe) repeated the design. Their pooled analysis of 3,723 patients in 138 hospitals found 90-day mortality of 24.9 per cent with the protocol and 25.4 per cent without, at higher cost (PRISM Investigators 2017). By then usual care included early antibiotics. **The benefit lay in speed and attention, not the catheter.**

FEAST. This is the most important sepsis trial for a post-collapse community, because it was done where such a community will be. Maitland and colleagues randomised over 3,000 children in Kenya, Tanzania and Uganda with severe febrile illness (impaired consciousness or respiratory distress) and impaired perfusion, judged by slow capillary refill, a cold-to-warm limb gradient, a weak radial pulse or a very fast heart rate. The refill threshold is over 2 seconds in the trial registration and 3 seconds or more in later accounts [VERIFY]. Children with malnutrition, gastroenteritis, burns or surgical conditions were excluded. In the main stratum of 3,141, children given a bolus of 20 to 40 mL/kg of albumin or saline died at 10.6 and 10.5 per cent within 48 hours, against 7.3 per cent of those given maintenance fluid alone at 4 mL/kg an hour (relative risk 1.45, 95 per cent confidence interval 1.13 to 1.86). At four weeks the figures were 12.2, 12.0 and 8.7 per cent. In a small stratum with severe hypotension, mortality was 69 per cent with albumin and 56 per cent with saline (Maitland et al 2011, abstract, registration and secondary summaries).

The extra deaths were from cardiovascular collapse: terminal shock in 4.6 per cent of bolus children against 2.6 per cent. Deaths from fluid overload did not differ. Boluses reversed shock faster at one hour, yet more children died. The 65 children who met the WHO's strict shock definition were also harmed (Maitland et al 2013). The WHO's later triage guidance kept boluses for that definition [VERIFY].

Adults. Andrews and colleagues tested an early resuscitation protocol in 209 Zambian adults with sepsis and low blood pressure, 89.5 per cent HIV positive. The protocol gave 2 L in the first hour and up to 4 L in six (a median of 3.5 L against 2.0 L), with dopamine. In-hospital mortality was 48.1 against 33.0 per cent, a relative risk of 1.46 and a number needed to harm of 7, with more worsening hypoxaemia (35.8 against 22.3 per cent). An earlier Zambian trial was stopped for harm in already breathless patients (Andrews et al 2017, secondary summary and registration). In rich-country intensive care, restriction made no difference: CLASSIC, with 1,554 patients, found 90-day mortality of 42.3 against 42.1 per cent with half the fluid (1,798 against 3,811 mL) (Meyhoff et al 2022, abstract), and CLOVERS, with 1,563, found no difference (Shapiro et al 2023, secondary summary). Quoted CLOVERS percentages of 14.0 and 14.9 I could not confirm [VERIFY]. The Surviving Sepsis Campaign downgraded the 30 mL/kg bolus to a weak recommendation in 2021 (Evans et al 2021). Jacob and colleagues, adapting guidance for African district hospitals, advised cautious fluids, only 1 mL/kg an hour where lung injury is suspected, and wrote that FEAST may apply to adults (Jacob et al 2013).

Inference. Boluses help a hospital patient whose breathing can be supported if the lungs flood. In two African trials without that support they killed. **The exception is the patient who has lost fluid through diarrhoea, vomiting, burns, bleeding or heat**, who needs the volume back by the rules of the rehydration report (THRIVING library, HY-03). The septic patient who has not lost fluid needs maintenance, not a flood. Grade A against boluses in African children without fluid loss and against aggressive protocols in African adults.

1.8 Fluids without a drip

By mouth. In children with gastroenteritis, oral rehydration failed 4 per cent more often than intravenous fluid (number needed to treat 25), but the intravenous groups had six deaths and the oral groups two (Hartling et al 2006). Oral fluid is the default for any septic patient who is awake and can swallow. The home solution (one litre of clean water, six level teaspoons of sugar, half a level teaspoon of salt) and the WHO salts are set out with their sources in HY-03 (THRIVING library, HY-03).

By nasogastric tube. For a child who cannot feed, the Pocket Book gives milk or sugar solution by tube (WHO

2005). For severe dehydration without a drip, WHO gives rehydration solution by tube at 20 mL/kg an hour for six hours, while MSF says a tube should not be used in shock. HY-03 concludes that without a drip the WHO fallback is the only option, in a patient awake enough to protect the airway (THRIVING library, HY-03). I agree, but add that a confused septic patient is the one most likely to vomit and inhale, so give small volumes, sit the patient up, and stop if the belly swells [VERIFY: inference].

Under the skin (hypodermoclysis). Normal saline through a fine butterfly needle (21 to 23 gauge) into the fat of the abdomen, chest or thigh runs at about 1 mL a minute per site, up to about 3 L in 24 hours over two sites and no more than 1 L in two hours. Hyaluronidase (150 units per litre) speeds absorption but is optional. It is contraindicated in shock, circulatory collapse, severe dehydration, severe heart failure and bleeding disorders, because skin is not perfused when the circulation fails. Pulmonary oedema occurred in 0.6 per cent. The infant harms of the 1950s came from electrolyte-free or hypertonic fluids, not the route (Sasson and Shvartzman 2001). A long-term care protocol uses a more modest 1 to 1.5 L a day [VERIFY] (WRHA 2020). **Hypodermoclysis is a maintenance route for a patient who cannot drink and is not in shock. It will not rescue shock.** Grade B.

1.9 Source control

Record. In 1,011 patients in 44 German intensive care units, source control later than six hours after onset was associated with 28-day mortality of 42.9 against 26.7 per cent (Bloos et al 2014, secondary summary). A Korean multicentre study found no association with timing (Korean source control study). A 2022 cohort of nearly 5,000 reported 29 per cent lower odds of death with control within six hours [VERIFY: source not traced]. Before antibiotics, drained abscesses mostly recovered, with 6 per cent deaths in major abscesses (Spellberg 2009, via THRIVING library, WO-14). Today 73.6 per cent of drained skin abscesses cure with placebo alone (Talan 2016, via THRIVING library, WO-14).

What a village can reach. Abscess: open and drain. Dead tissue (black, grey, foul, crackling, or pain out of proportion): cut to bleeding tissue (THRIVING library, WO-14). Retained placenta or products of conception: remove them. Prophylaxis at manual removal is commonly ampicillin 2 g or cefazolin 1 g with metronidazole 500 mg, though the Cochrane review found the evidence very uncertain (Cochrane review CD004904). For established infection of the womb after birth, WHO's first choice is clindamycin with gentamicin, on very low certainty evidence (WHO 2015, secondary summary). Catheter or line in place for days: remove it. Full bladder: empty it. Pus in the chest or a joint: the infirmary.

Inference. An antibiotic cannot sterilise a closed bag of pus or dead tissue. Every septic patient needs a search for the source, undressed and in good light. Grade B.

1.10 Salvaged antibiotics and doses without a culture

There will be no culture. The drug is chosen by likely source, the dose by weight. The salvage report (IN-05) does not yet exist, so this covers the three regimens in the brief.

Drug	Adult	Child over 1 month	Newborn	Sources and differences
Ceftriaxone, injection	1 to 2 g once daily. Meningitis 2 g twice daily or 4 g once (MSF), 2 to 4 g once (SmPC)	50 to 100 mg/kg once daily, maximum 4 g, higher end for bacteraemia	Not with jaundice or calcium-containing fluids (MSF)	MSF Essential Drugs, ceftriaxone SmPC agree. Intramuscular doses over 1 g split between two buttocks, over 2 g by vein only (MSF)
Ampicillin, injection	1 to 2 g every 6 to 8 hours, meningitis 2 g every 4 hours	50 to 100 mg/kg every 8 hours	50 to 100 mg/kg every 8 to 12 hours	MSF. One Health Trust prints "200 mg/kg every 4 hours" for adults, clearly an error for a daily total. One checked source [VERIFY]
Gentamicin, injection	5 to 6 mg/kg once daily (MSF), 5 to 7 mg/kg every 24 hours (ISMP Canada)	4.5 to 7.5 mg/kg once daily	3 mg/kg once daily under 2 kg, 5 mg/kg heavier	MSF, ISMP Canada, gentamicin SmPC. One Health Trust gives 2 mg/kg every 12 hours for 5 days
Amoxicillin, by mouth	1 g three times daily	25 mg/kg twice daily, high dose 30 mg/kg three times daily	About 100 mg/kg a day in two doses with gentamicin (AFRINEST, via IN-03)	MSF, AFRINEST Group 2015, (THRIVING library, IN-03)
Metronidazole, by mouth	500 mg every 8 hours (MSF, ICRC) or 6 hours (WHO 2010)	Not checked [VERIFY]	Not checked [VERIFY]	MSF, (THRIVING library, WO-14)

Which regimen [VERIFY: my synthesis of Jacob et al 2013, MSF and WHO]: - Unknown source, chest, urine, suspected meningitis: ceftriaxone. - Newborns, or when ceftriaxone runs out: ampicillin with gentamicin, the WHO standard for young infants (AFRINEST Group 2015, Jacob et al 2013). - Belly, womb after birth, dead tissue, foul pus: add metronidazole. A patient who can swallow and keep it down can have amoxicillin with metronidazole by mouth.

Gentamicin is the most dangerous of these. Its damage to the inner ear is irreversible, and kidney damage occurs in about 10 per cent. Hospital targets (once-daily peak under 10 mg/L, trough under 1 mg/L) cannot be measured in a village. A mitochondrial variant (m.1555A>G) greatly raises the risk of deafness (gentamicin SmPC). In pregnancy it can deafen the fetus (MSF). **Stop it at once for dizziness, ringing in the ears or hearing loss** (MSF). Keep courses short and dose a heavy adult by estimated lean weight [VERIFY: hospital practice not read in full].

Newborns. In the AFRINEST trial, 3,564 young infants in the Democratic Republic of Congo, Kenya and Nigeria, whose families refused referral, failed treatment by day 8 at 8 per cent on seven days of injections, 6 per cent on two days of gentamicin with seven of oral amoxicillin, 8 per cent on two days of injections then oral amoxicillin, and 5

per cent on seven days of gentamicin with oral amoxicillin. Critically ill infants were excluded (AFRINEST Group 2015, secondary summary). Grade A for this group.

Child doses in adults. The commonest error after the Fall will be a half-remembered child's dose given to an adult, or an adult vial to a child. Adult ceftriaxone is a fixed 1 to 2 g. A child's is per kilogram up to the same maximum. Write the weight and the arithmetic on the patient's card.

1.11 Sugar, warmth, position and fever

Sugar. In 3,319 febrile Tanzanian children, 3.2 per cent had glucose under 2.5 mmol/L, with an adjusted odds ratio for death of 9.8 (Nadjm et al 2013) [VERIFY author]. Hypoglycaemic children died at 19.3 per cent in Mozambique (Mozambique hypoglycaemia study) and 5 of 19 in a Malawian cohort (Malawi referral cohort). The Pocket Book treats glucose under 2.5 mmol/L (under 3 in severe malnutrition) with 5 mL/kg of 10 per cent glucose into a vein, rechecked after 30 minutes. A child who cannot feed gets milk or sugar solution by tube: four level teaspoons (20 g) of sugar in a 200 mL cup of clean water (WHO 2005). I found only this one source for the recipe [VERIFY]. Raising the treatment threshold to 5 mmol/L was tested in the SugarFACT trial and reported not to help [VERIFY result]. Without a meter, a drowsy or convulsing septic child should be assumed hypoglycaemic and given sugar by mouth or tube if the airway allows [VERIFY: inference]. Grade B.

Warmth. Gadchiroli kept newborns warm as part of sepsis care (Bang 1999, via THRIVING library, IN-01). A low temperature scores as danger in adults (Rwanda UVA study). Keep the patient warm and dry, the newborn skin to skin. Grade B for newborns, C for adults [VERIFY: no trial in adult sepsis found].

Position. Lie a drowsy patient on the side, prop up a breathless one, and turn every two hours [VERIFY: standard nursing interval, not sourced here]. Sit up to feed and stay upright half an hour after (THRIVING library, IN-03). Grade C.

Fever. External cooling of 200 French patients with septic shock lowered day-14 mortality (19 against 34 per cent), a secondary outcome that had vanished by discharge (Schortgen et al 2012, secondary summary). Paracetamol 1 g every six hours in the HEAT trial lowered temperature by about a quarter of a degree and did not change 90-day mortality, 15.9 against 16.6 per cent (Young et al 2015, secondary summary). Tepid sponging in seven trials with 467 children caused shivering five times as often (Meremikwu and Oyo-Ita 2003). **Treat fever for comfort, not to cure sepsis.** Grade A that lowering temperature does not change survival.

1.12 Tradition: bleeding, purging, cold water, fever plants

Bleeding. *Tradition:* for two thousand years fever and inflammation were treated by removing blood. Gordon bled puerperal fever of 20 to 24 ounces at once, about 570 to 680 mL (my arithmetic), and held that smaller bleedings failed. William Hey of Leeds bled 30 to 50 ounces (Hektoen International). *Record:* Pierre Louis compared 77 pneumonia patients by the day bleeding began. Those bled in the first four days died at 44 per cent, those bled later at 25 per cent, and he concluded that bleeding did far less than believed, though the early group was older (Louis 1835). *Inference:* a septic patient is already short of circulating volume, and half a litre removed is half the fluid a modern protocol would give. Grade X.

Purging and emetics. *Tradition:* clearing the gut was standard. *Record:* no trial. *Inference:* it adds diarrhoea's losses to sepsis. Grade X [VERIFY: physiology only].

Cold water. *Tradition:* cold baths and wraps for fever, still common. *Record:* sponging causes shivering without benefit in children (Meremikwu and Oyo-Ita 2003). *Inference:* on cold mottled skin it closes vessels further. Grade X in shock, D for comfort in a hot adult [VERIFY].

Fever plants. Willow bark (*Salix alba* and related species) supplies salicylates. Cinchona bark (*Cinchona officinalis*, *C. pubescens* and others) supplies quinine, which cures malaria and nothing else here (THRIVING library, FO-05).

High-dose salicylates in 1918 (8 to 31 g a day) caused over-breathing and lung fluid (Starko 2009, via THRIVING library, FO-01). I found no plant with any trial evidence against death from bacterial sepsis [VERIFY]. In malarial regions a febrile patient in shock may have severe malaria and needs an antimalarial too (THRIVING library, FO-05) [VERIFY: inference]. Grade D for febrifuges in sepsis, X when they replace an antibiotic.

1.13 Comfort for the dying

Not every septic patient can be saved. Late signs of dying in cancer patients include no radial pulse, under 100 mL of urine in 12 hours, Cheyne-Stokes or jaw breathing and the death rattle, each strongly predicting death within three days (Hui 2014 and 2015, via THRIVING library, FO-07). They are not sepsis studies [VERIFY]. In 129 hospice patients, 1 L of fluid a day under the skin did no better than 100 mL for symptoms, delirium, quality of life or survival (Bruera et al 2013, secondary summary). **Fluid forced into the dying does not comfort them.** A moist mouth, a turned body, a clean bed, warmth, quiet and someone who stays do. Pain relief belongs to the absent nursing report (NU-02).

2. Evidence grades

Practice	Grade	Tradition	Record	Inference
qSOFA as trigger	A prognosis, B lay use	None	Misses half of deaths, specific	Trigger, never a reason to wait
UVA score	B	None	Beats qSOFA in Africa	Needs oximeter for full use
Capillary refill over 3 s	A target, B prognosis	Nail colour watched	Better target than lactate	Best free test
Mottling	B	Marbled skin feared	OR 16 to 74	Free, harder on dark skin
Shaking chills	B	Rigor feared	RR 12.1 for bacteraemia	Act on a true rigor
IMCI danger signs	B	Mothers' judgment	OR 5 to 9 for death	Any one means act
Early antibiotic	B	None before 1936	4 to 7.6% per hour in shock	First dose before the journey
Sulphonamides in puerperal sepsis	B	None	About 25% to 8%	Large effect, historical controls
Village newborn sepsis care	B	Warmth, breastfeeding	16.6% to 2.8%	Lay workers can do it
Gentamicin plus oral amoxicillin, infants	A	None	Non-inferior (AFRINEST)	Use when referral impossible
Early goal-directed therapy	A, no benefit	None	PRISM 24.9 vs 25.4%	Speed matters, catheter does not
Bolus in African children without loss	X	None	RR 1.45 for death (FEAST)	Maintenance only
Aggressive fluid in African adults	X	None	48.1 vs 33.0% (Andrews)	Cautious, stop if breathless
Replacing actual losses	A	Broths, drinks	Oral rehydration record	Distinct from sepsis alone

Practice	Grade	Tradition	Record	Inference
Hypodermoclysis	B	None	Safe with saline, not in shock	Maintenance only
Nasogastric fluid	B	None	WHO fallback, MSF opposes in shock	Awake patients only
Source control	B	Lancing abscesses	42.9 vs 26.7% with delay	Drugs cannot sterilise pus
Sugar for drowsy child	B	Sweet drinks	aOR 9.8 for death	Assume and treat
Warmth for newborns	B	Swaddling	Part of Gadchiroli	Keep warm
Lowering fever	A, no survival effect	Cold water, febrifuges	HEAT no effect	Comfort only
Tepid sponging, children	X	Common	Shivering RR 5.09	Do not
Bloodletting	X	Two thousand years	Louis 1835	Removes volume
Purging, emetics	X	Common	None	Adds losses
Plant febrifuges as cures	D, X if replacing antibiotics	Universal	None in sepsis	Quinine for malaria only
Forced hydration of the dying	X	Common	No benefit (Bruera)	Mouth care instead

3. Means ledger

Rung	What it can do	What it cannot do
Hands and knowledge	Count breaths, question, feel the pulse, press for refill, look for mottling, ask about urine, find the source. Position, warmth, drinks, turning, staying. Decide when to send and when to comfort	No drug, no measured fluid, no deep drainage
Hearth	Boiled water, home rehydration solution, sugar solution (20 g in 200 mL), warmth, clean cloth, a marked jug, a clock for counting, a clean knife for a superficial abscess	No antibiotic, no sterile fluid for veins
Garden and still	Ethanol for skin and instruments, honey and sugar for wounds (THRIVING library, WO-14), willow and cinchona for fever, cinchona for malaria (THRIVING library, FO-05)	No plant cure for bacterial sepsis. Making antibiotics belongs to a report not yet in the library

Rung	What it can do	What it cannot do
Village dispensary (300, microscope)	Glass slide for refill. Microscope for malaria films and stained pus [VERIFY: stain supply]. Salvaged ceftriaxone, gentamicin, ampicillin, amoxicillin, metronidazole with a dose chart. Nasogastric tubes, butterfly needles, scale, thermometer, glucose meter while strips last	No sterile intravenous fluid in volume, no gentamicin levels, no surgery beyond simple drainage
District infirmary (3,000, nurse or doctor, ten beds)	Cannulas and controlled sterile saline [VERIFY: feasibility]. Manual removal of placenta, evacuation of the womb, drainage of deeper abscesses, excision of dead tissue. Hourly charts through the night. Oxygen if a concentrator and power exist	No vasopressors, ventilation, dialysis or cultures
Pre-Fall hospital (reference)	Cultures, lactate, imaging, vasopressors, ventilation, dialysis, surgery at any hour	Even here septic shock kills over 40 per cent (Singer et al 2016)

Today and after the Fall. Today the best thing a lay person can do is recognise sepsis early and get the patient to hospital. After the Fall the distance becomes days or infinite. Recognition still comes first, the antibiotic becomes most of the treatment that matters, source control second and nursing third. Intensive care adds a few percentage points over a prompt antibiotic in typical cases, and that is what disappears [VERIFY: inference from PRISM and the pneumonia record in IN-03]. The African trials, not the American ones, are the evidence base for the world after the Fall.

4. Harm test

1. Fluid boluses in febrile children without fluid loss: 45 per cent more deaths at 48 hours, from collapse that cannot be watched for (Maitland et al 2011, Maitland et al 2013).
2. Aggressive fluids in adults without a ventilator: one extra death in seven (Andrews et al 2017).
3. Gentamicin: permanent deafness and kidney damage with no blood levels (gentamicin SmPC), fetal deafness in pregnancy (MSF).
4. Ceftriaxone in jaundiced newborns or with calcium-containing fluids (MSF).
5. Dose errors: child doses in adults, adult vials in children, and printed errors such as “200 mg/kg every 4 hours” (One Health Trust).
6. Nasogastric fluid in a drowsy patient: aspiration (THRIVING library, HY-03).
7. Hypodermoclysis in shock: fluid pools in unperfused skin (Sasson and Shvartzman 2001).
8. Bleeding, purging and emetics: volume removed from a failing circulation (Louis 1835).
9. Cold water on a mottled patient: shivering and vessel closure [VERIFY: extrapolated from children].
10. High-dose salicylates: over-breathing, lung fluid (Starko 2009, via THRIVING library, FO-01).
11. An antibiotic treated as enough: a missed abscess or retained placenta kills despite the right drug.
12. Waiting for a score: qSOFA misses half of deaths (Fernando et al 2018).
13. False hope: promising a cure for the dying takes away the chance to say goodbye.

5. Red flags

In anyone with a known or suspected infection, any one of these means treat as sepsis now:

- Breathing 22 or more a minute in an adult (25 or more in pregnancy), counted for a full minute.
- New confusion, drowsiness or agitation. "Not herself."
- Weak or absent wrist pulse, or systolic pressure 100 or less (90 or less in pregnancy).
- Capillary refill over 3 seconds in a warm room.
- Mottled skin spreading from the knees.
- Shaking chills under a thick blanket.
- No urine for 12 hours [VERIFY: my threshold].
- Temperature under 36°C with infection.
- Child: cannot drink or breastfeed, vomits everything, convulsions, lethargic or unconscious, cold hands with slow refill and a weak fast pulse.
- Young infant: feeding difficulty, convulsions, moves only when stimulated, breathing 60 or more, severe indrawing, temperature 37.5°C or more or below 35.5°C.
- After birth or miscarriage: fever, foul discharge, tender womb, or an incomplete placenta.
- A wound with pain out of proportion, spreading redness, grey or black tissue, crackling, or a foul smell.

6. The case against

Against qSOFA in the village. Makam and Nguyen argued that the case for qSOFA rested on area-under-the-curve comparisons with little bedside meaning (Seymour et al 2016). The Surviving Sepsis Campaign rejects it as a single screen (Evans et al 2021), and SAILORS found its performance varied between poor-country cohorts (Rudd et al 2018). A score that misses half the deaths could falsely reassure. *Answer:* it is used here as a trigger, not a gate, alongside refill, mottling, rigors, urine and danger signs.

Against the hour. Kumar's 7.6 per cent per hour came from a retrospective study of shocked patients, and the New York data gave about 4 per cent per hour (Seymour et al 2017). An "antibiotic for every fever within the hour" rule would empty a dispensary in a season. *Answer:* the hour applies to recognised sepsis with organ failure, not to fever. The pneumonia report's finding that many children with fast breathing alone recover without a drug (THRIVING library, IN-03) supports holding antibiotics for the sick and giving them fast to those who are.

Against restricting fluid. FEAST excluded diarrhoea, malnutrition and burns, and Andrews's patients were mostly HIV positive, so neither result may apply to an ordinary adult with pneumonia [VERIFY: I found no named critic making this argument]. Rich-country trials found no difference either way (Meyhoff et al 2022, Shapiro et al 2023). *Answer:* this report keeps full replacement for those who have lost fluid and withholds only boluses from those who have not. Where African trials show harm and rich-country trials no difference, caution costs nothing.

Against gentamicin in villages. Unmonitored, it could deafen a generation of children. *Answer:* Gadchiroli and AFRINEST used it in communities in short courses (Bang 1999, via THRIVING library, IN-01, AFRINEST Group 2015). It is reserved for sepsis, with ceftriaxone preferred.

Against salvaged antibiotics. Expired, heat-damaged stock and unknown resistance may make the drug useless. Dünser and colleagues stressed adapting recommendations to what is available [VERIFY: not read]. *Answer:* this is why source control and nursing must be taught as hard as antibiotics, with records of who recovers on which drug.

Against hypodermoclysis. It was abandoned after infant deaths in the 1950s. *Answer:* those came from electrolyte-free or hypertonic fluids (Sasson and Shvartzman 2001).

Against the history. Colebrook's fall from 25 to 8 per cent happened while streptococcal virulence was falling, and the bacteraemia series are of hospital patients [VERIFY]. *Answer:* the numbers give scale, not precision. Every source agrees that untreated bacteraemia killed most of those it touched.

7. 10-line summary

1. Sepsis is organ failure caused by the body's reaction to infection, and it kills over days, not hours.
2. Recognise it by breath count, confusion and a weak pulse, plus refill over 3 seconds, mottled knees, shaking chills and no urine.
3. qSOFA misses half the deaths, so it triggers action but never excuses waiting.
4. In children, any IMCI danger sign with infection means sepsis.
5. Untreated bacteraemia killed two-thirds to four-fifths, and sulphonamides cut puerperal sepsis deaths from about 25 to 8 per cent.
6. Give the first antibiotic dose at recognition: ceftriaxone, or ampicillin with gentamicin, adding metronidazole for belly, womb or dead tissue.
7. Find and remove the source: drain pus, cut dead tissue, empty the womb, pull the catheter.
8. Do not give fluid boluses to children or adults who have not lost fluid. Replace real losses by mouth or tube.
9. Give sugar to the drowsy child, keep newborns warm, lie the drowsy on their side, treat fever only for comfort.
10. Do not bleed, purge or chill the septic, and when death comes, give comfort, not fluid.

8. Open questions

1. Do refill and mottling work on dark skin, in lamplight, in lay hands?
2. What lay urine threshold marks treatable sepsis?
3. Does the FEAST harm extend to adults outside HIV-heavy populations, as Jacob et al 2013 suggest it may?
4. How long do salvaged ceftriaxone, ampicillin and gentamicin powders keep beyond expiry? (IN-05, absent.)
5. Can gentamicin toxicity be caught without a laboratory, for example by a hearing or balance check before each dose?
6. What is the evidence for sugar under the tongue in children who cannot swallow?
7. The FEAST refill threshold and the "over 70 per cent" streptococcal bacteraemia figure remain unresolved.
8. Is there any plant with systemic antibacterial effect large enough to matter in sepsis? None was found.

9. Sources to read in full

1. Maitland et al 2011 and 2013 (FEAST), for entry criteria and the mechanism of harm.
2. Andrews et al 2017, for the Zambian protocol.
3. Dünser et al 2012 and Dondorp, Dünser and Schultz 2019 (open access).
4. WHO Pocket Book of Hospital Care for Children, 2013 edition (only 2005 was read).
5. MSF Clinical Guidelines, shock chapter (the page could not be opened).
6. Kumar et al 2006, to resolve the first-hour survival figure.
7. Colebrook and Kenny 1936 and Colebrook and Purdie 1937, to resolve the series.
8. Moore et al 2017, for the original UVA points.
9. The WHO AWaRe antibiotic book (2022), which could not be opened.

10. At the bedside after the Fall

A woman of thirty is brought in four days after a long labour at home. She shakes under two blankets. Her husband says she talked nonsense in the night. You count 28 breaths in a full minute. Her wrist pulse is fast and thin. A glass slide on her fingertip for ten seconds gives four seconds of refill. Faint marbling covers both knees. She has passed no urine since yesterday morning. That is sepsis, probably shock.

You wait for nothing. Ceftriaxone 2 g goes into her muscles, 1 g in each buttock, with metronidazole by mouth. If there is no ceftriaxone, ampicillin 2 g with gentamicin at about 5 mg/kg. You write the time on her card.

Then the source. Her womb is tender, the discharge foul, and the midwife's note says the placenta came out ragged.

No antibiotic will sterilise that. If the infirmary can be reached she goes now. If not, the most experienced hand in the village empties the womb.

She has lost no fluid, so you do not flood her. Rehydration solution goes in by the cup, sip by sip. You keep her warm and on her side, and chart breaths, pulse, refill and urine every hour by lamplight. If her breathing worsens as fluid goes in, you stop.

By morning her refill is shorter, her mind clearer and her urine back, or they are not. If they are, you continue the drugs and watch. If she is cold, silent, pulseless at the wrist and making no urine, you stop pressing fluid on her and bring her family in. Comfort is owed then, and you give it.

11. Protocols

These protocols are my synthesis. Each quantity has a source, but the combination has not been tested as a package [VERIFY].

11.1 Recognise in one minute

Step	Action	Positive if	Time
1	Is there an infection? Wound, cough, urine, birth, belly, skin, cord	Any	10 s
2	Ask where they are and what day it is	Wrong, slow, drowsy	10 s
3	Count breaths (full minute, or 30 s doubled if rushed)	Adult 22 or more, pregnancy 25 or more, child per IMCI	30 to 60 s
4	Feel the wrist pulse	Weak, thready, absent	10 s
5	Press a fingertip (glass slide) for 10 s and release	Refill over 3 s in a warm room	15 s
6	Look at the knees	Mottling	5 s
7	Ask about shaking chills and the last urine	Shaking under blankets, none for 12 h [VERIFY]	10 s

Two or more of steps 2 to 4 is sepsis by qSOFA (Singer et al 2016). Any one of steps 2 to 7 in a patient who looks ill is treated as sepsis [VERIFY: my rule, deliberately more sensitive].

11.2 Act in the first hour

1. **Antibiotic first**, within minutes. Adult: ceftriaxone 2 g, or ampicillin 2 g with gentamicin 5 mg/kg. Child over a month: ceftriaxone 50 to 100 mg/kg (maximum 4 g), or ampicillin 50 to 100 mg/kg with gentamicin 4.5 to 7.5 mg/kg. Newborn: ampicillin with gentamicin, 3 mg/kg under 2 kg, 5 mg/kg heavier. Add metronidazole 500 mg every 8 hours for belly, womb, dead tissue or foul pus (MSF, AFRINEST Group 2015). Record time, drug and dose.
2. **Sugar.** Drowsy or convulsing child: glucose under 2.5 mmol/L on a meter means 10 per cent glucose 5 mL/kg by vein, recheck in 30 minutes (WHO 2005). Without meter or vein, sugar solution (20 g in 200 mL) by mouth or tube, 5 mL/kg to start [VERIFY: volume my inference].
3. **Position and warmth.** On the side if drowsy, propped up if breathless, dry and covered, newborn skin to skin.

4. **Find the source.** Undress fully in good light: skin, wounds, joints, breasts, perineum, womb, belly, urine, chest, lines and catheters.
5. **Fluid** by 11.3.
6. **Chart** breaths, pulse, refill, mind and urine hourly.
7. **Send** to the infirmary if it can be reached, with the card.

11.3 Fluids

Patient	What	How much	Stop or slow if
Lost fluid (diarrhoea, vomiting, burns, bleeding)	Rehydration solution, WHO Plan B or C	As in HY-03. Adult up to 750 mL an hour by mouth (THRIVING library, HY-03)	Puffy eyelids, worse breathing, crackles
Septic child, no loss, can drink	Breast milk, rehydration or sugar solution	Maintenance. FEAST controls had 4 mL/kg an hour by vein (Maitland et al 2011) [VERIFY: applied by mouth]	Vomiting, swollen belly
Septic child, no loss, cannot drink	Same by nasogastric tube if awake enough	Maintenance. No bolus (Maitland et al 2011)	Vomiting, drowsiness, swollen belly
Septic adult, no loss, can drink	Rehydration solution or sugared water	Frequent sips, about 1 L over the first hours [VERIFY: no direct source]	Rising breathlessness
Septic adult, weak pulse, vein available, not breathless	Normal saline or Ringer's lactate	Small amounts with reassessment, far below Andrews's 2 L in an hour [VERIFY: no trial gives a safe volume here]	Breathing up 5 a minute, pulse up 15 a minute (WHO 2005, a child chart), crackles
Breathless or crackling	No bolus	1 mL/kg an hour at most (Jacob et al 2013)	Any worsening
Cannot drink, not in shock	Hypodermoclysis, normal saline	About 1 mL a minute per site, up to about 3 L a day over two sites, no more than 1 L in 2 hours (Sasson and Shvartzman 2001), or 1 to 1.5 L a day (WRHA 2020)	Swelling that does not absorb, redness, shock

11.4 Source control checklist

- Abscess: open and drain, without routine packing (THRIVING library, WO-14).
- Dead tissue: cut to bleeding tissue. Gas or crackling is urgent (THRIVING library, WO-14).
- After birth or miscarriage: check the placenta was complete. Retained tissue goes to the most skilled hand. Before manual removal give ampicillin 2 g or cefazolin 1 g with metronidazole 500 mg if stock allows (Cochrane review CD004904).
- Urine: empty a full bladder, remove an old catheter.
- Lines: remove any line in a vein that has been in with fever.

- Aim to finish within six hours (Bloos et al 2014).

11.5 When there is no antibiotic

1. Recognise and record as in 11.1.
2. Source control becomes the main treatment: drain, debride, empty.
3. Fluids by 11.3, sugar, warmth, position, turning every two hours [VERIFY].
4. Keep wounds and dressings clean (THRIVING library, WO-14).
5. Treat fever for comfort only. No cold plunges, bleeding or purging.
6. Watch hourly. Most local infections recovered without drugs and most bacteraemias did not. Tell the family so.
7. Send a runner for any antibiotic within a day's travel.

11.6 When to stop

- **Antibiotics.** AFRINEST used seven days in infants (AFRINEST Group 2015). One Health Trust gives ten-day courses for adult sepsis (One Health Trust). Typical practice is 7 to 10 days, longer for undrained pus or bone [VERIFY]. Switch to oral amoxicillin, with metronidazole if anaerobes are likely, once the patient eats, the fever settles and refill and mind are normal [VERIFY: my criteria].
- **Gentamicin.** Stop at once for dizziness, ringing ears or hearing loss (MSF). Five days or fewer (One Health Trust) [VERIFY].
- **Fluid.** Stop for rising breath rate, new crackles or puffy eyelids (WHO 2005, THRIVING library, HY-03).
- **Active treatment.** Consider stopping when the late signs of dying appear and the patient has not responded to antibiotic, source control and nursing over a day or more (Hui 2014 and 2015, via THRIVING library, FO-07) [VERIFY: not validated in sepsis].

11.7 Comfort for the dying

- Stop pushing fluid. Moisten mouth and lips hourly (Bruera et al 2013).
- Turn gently, keep clean, dry and warm.
- Lie on the side for the death rattle.
- Let the family stay, and tell them plainly what is happening.
- Do not sell hope. Say what the record says.

12. Numbers to carry

Item	Number	Source
qSOFA breaths	22 or more (pregnancy 25 or more)	Singer et al 2016, SOMANZ
qSOFA pressure	Systolic 100 or less (pregnancy 90 or less)	Singer et al 2016, SOMANZ
Deaths caught by qSOFA	About half	Fernando et al 2018, Song et al 2018
Capillary refill	Over 3 s abnormal, slide pressed 10 s	Hernández et al 2019
Shaking chills	Bacteraemia risk 12 times	Tokuda et al 2005
Untreated bacteraemia	66 to 82 per cent died	NCT03138733 protocol
Puerperal sepsis with prontosil	About 25 down to 8 per cent	Colebrook and Kenny 1936
Antibiotic delay	7.6 per cent survival an hour in shock (Kumar), about 4 per cent (Seymour)	Kumar et al 2006, Seymour et al 2017
FEAST	10.6 against 7.3 per cent dead at 48 h	Maitland et al 2011

Item	Number	Source
Zambian adults	48.1 against 33.0 per cent dead	Andrews et al 2017
Child maintenance	4 mL/kg an hour	Maitland et al 2011
Sugar solution	20 g (4 level teaspoons) in 200 mL	WHO 2005
Glucose by vein	10 per cent, 5 mL/kg if under 2.5 mmol/L	WHO 2005
Ceftriaxone	Adult 1 to 2 g daily, child 50 to 100 mg/kg (maximum 4 g)	MSF, SmPC
Gentamicin	Adult 5 to 7 mg/kg daily, child 4.5 to 7.5, newborn 3 or 5	MSF, ISMP Canada
Ampicillin	Adult 1 to 2 g every 6 to 8 h, child 50 to 100 mg/kg every 8 h	MSF
Metronidazole	500 mg every 8 h (some say 6 h)	MSF, WO-14
Hypodermoclysis	1 mL a minute a site, about 3 L a day, not in shock	Sasson and Shvartzman 2001
Source control	Within 6 hours	Bloos et al 2014
Septic shock in hospital	Over 40 per cent die	Singer et al 2016

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Where I disagree with the library. With HY-03, I accept the WHO nasogastric fallback but add that confusion in sepsis makes aspiration likelier than in plain dehydration. IN-03 marks Klugman's intervals unchecked, and I could not check them either. IN-01 quotes the April 1847 Vienna figure without the caveat HY-01 rightly adds.