

Moving Beyond Homebrew: Does a Ready-to-Use Povidone-Iodine Irrigation System Improve Early Infection-Related Outcomes in Primary Total Knee Arthroplasty?

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BACKGROUND

- Povidone-iodine (PVP-I) is frequently used for antimicrobial irrigation during primary total knee arthroplasty (TKA)
- Irrigation is either manually diluted and prepared intraoperatively (“homebrew”) or provided as a packaged, sterile, ready-to-use solution

OBJECTIVES

- Compare early infection-related outcomes of ready-to-use PVP-I versus homebrew PVP-I in TKA

METHODS

- Inclusion: primary, unilateral, elective TKA from 2021-25, 90-day follow-up
- Patients received either terminally sterilized, ready-to-use or homebrew PVP-I irrigation
- 1:1 propensity score match performed using age, sex, body mass index (BMI), diabetes status, smoking status, and American Society of Anesthesiologists (ASA) class
- Final cohort: 3,926 patients, median follow-up 1.1 years
- Primary outcome: infection-related reoperation or revision

RESULTS

- Infection-related reoperation or revision did not differ between ready-to-use and homebrew groups ($P = 0.491$)
- Wound irrigation and debridement performed in 6 patients in the ready-to-use group, 13 patients in the homebrew group ($P = 0.107$)
- Septic revision occurred in 9 patients in the ready-to-use group, 6 patients in the homebrew group ($P = 0.438$)
- Patients receiving ready-to-use PVP-I had shorter length of stay (32 vs. 40 hours, $P < 0.001$)
- No difference in aseptic reoperation incidence ($P = 0.092$); aseptic revision incidence higher in homebrew group ($P = 0.017$)

CONCLUSIONS

- Ready-to-use PVP-I irrigation showed no differences in early infection-related reoperation/revision rates compared with homebrew PVP-I; associated with a shorter length of stay
- Longer follow-up is needed to evaluate differences in mid- and long-term infection-free survivorship

Table 1. Baseline characteristics.

Parameter	Ready-to-Use n = 1,963	Homebrew n = 1,963	P-value
Age (years), median	69 [31-90]	69 [24-93]	0.726
BMI (kg/m ²), median [range]	31.5 [17-55]	31.8 [18-56]	0.413
Sex, %			
Men	35	34	0.459
Women	65	66	
Race, %			
White	63	54	<0.001
Black	14	20	
Other	15	13	
Not Reported	7	13	
Smoking Status, %			
Current	4	4	0.973
Former	35	34	
Never	62	62	
Diabetes, %	25	25	0.970
ASA Class, %			
I	1	1	0.245
II	56	59	
III	43	40	
IV	1	1	
CCI, mean [SD]	1.9 [2.3]	1.7 [2.1]	0.073
BMI, body mass index; kg, kilogram; m, meter; %, percent; ASA, American Society of Anesthesiologists; CCI, Charlson Comorbidity Index; SD, standard deviation. Bold indicates statistical significance ($P < 0.05$).			

Table 3. Aseptic reoperations and revisions.

Parameter	Ready-to-Use n = 1,963	Homebrew n = 1,963	P-value
Reoperation, n (%)	3 (0.2)	10 (0.5)	0.092
Wound I&D	1	5	0.218
EMR	1	2	0.999
Lysis of Adhesions	1	3	0.625
Revision, n (%)	20 (1.0)	39 (2.0)	0.017
Loosening	3	10	0.092
Instability	7	11	0.480
PPF	1	2	0.999
Arthrofibrosis	9	11	0.823
Anterior Knee Pain	0	5	0.062
n, number of; %, percent; I&D, irrigation and debridement; EMR, extensor mechanism repair; PPF, periprosthetic fracture. Bold indicates statistical significance ($P < 0.05$).			

Table 2. Perioperative characteristics.

Parameter	Ready-to-Use n = 1,963	Homebrew n = 1,963	P-value
Laterality, %			
Right	53	51	0.103
Left	47	49	
Anesthesia Type, %			
Spinal	93	94	0.127
General	7	6	
Operative Time (minutes), mean [SD]	107.7 [28]	107.6 [22]	0.024
LOS (hours), mean [SD]	32 [28]	40 [33]	<0.001
Discharge Disposition, %			
Home	96	95	0.098
SNF	4	5	
ARF	0	1	
%, percent; SD, standard deviation; LOS, length of stay; SNF, skilled nursing facility; ARF, acute rehab facility. Bold indicates statistical significance (<i>P</i><0.05).			

Parameter	Ready-to-Use n = 1,963	Homebrew n = 1,963	P-value
Reoperation/Revision, n (%)	15 (0.8)	19 (1.0)	0.491
Wound I&D	6 (0.3)	13 (0.7)	0.107
Septic Revision	9 (0.5)	6 (0.3)	0.438
n, number of; %, percent; I&D, irrigation and debridement. Bold indicates statistical significance ($P < 0.05$).			