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Kestle JRW, Holubkov R, Douglas Cochrane D, Kulkarni AV, Limbrick DD, Luerssen TG, et al.: A new hydrocephalus clinical research network protocol to reduce cerebrospinal fluid shunt infection. J Neurosurg Pediatr: 1–6, 2015

In 2007, the Hydrocephalus Research Network (HCRN) established an 11-step standardized protocol for reducing cerebrospinal shunt infection rates. Upon assessment two years after inception, participating pediatric centers demonstrated significantly reduced rates of shunt infections. Nonetheless, it became apparent after the initial report that some centers concurrently use antibiotic–impregnated catheters (AIC's), which necessitated a revision of the protocol in 2012 to incorporate AIC's.

Under the revised (new) protocol, enrolled patients were monitored for the first 6 months following their shunt insertion or revision, for a primary endpoint of a shunt infection. Of the 1935 procedures, full compliance with the protocol yielded a significant relative (shunt infection) risk reduction of 3.7% when compared with procedures that were not fully compliant Logistic regression models showed that compliance with AIC's were the only independent factor associated with infections, yielding a risk reduction of 9% to 5%, Nevertheless, when the overall outcomes of the new protocol was compared to that of the old protocol, there was no significant difference in the rates of infection, 6.0% versus 5.7% respectively.

Israelsson H, Allard P, Eklund A, Malm J: Symptoms of depression are common in patients with idiopathic normal pressure hydrocephalus. Neurosurgery: 1, 2015

Depression is commonly found in elderly patients with many forms of dementia, but its particular role and prevalence in idiopathic normal pressure hydrocephalus (iNPH) has not been well elucidated.

The article presents a multicenter retrospective study of iNPH patients aged 60-85 years who underwent shunt surgery in Sweden between 2008 and 2010. Age- and gender-matched participants were selected from a national database as the control group. Each participant completed a questionnaire, underwent a clinic assessment by a specialized iNPH team and was screened for depression using a self-reported Geriatric Depression Scale (GDS-15). Preoperative depression scores were obtained from additional GDS-15 forms completed by each iNPH patient as they

recalled how they felt the year preceding their shunt surgery.

Overall, 165 iNPH patients were matched to 364 controls. Shunted iNPH patients scored higher both pre- (5.9) and post-operatively (4.9) on the GDS-15 than the controls (1.9). In fact, the prevalence of depression in the shunted iNPH group was 46% and they were 4 times and 7 times more likely to have suspected depression or severe suspected depression respectively when compared to the control group. There was a statistical difference between the pre- and post-operative GDS-15 scores among shunted iNPH patients. In addition, impaired gait and modified Rankin Score (mRS) positively correlated with with high scores of GDS-15.

Kazui H, Miyajima M, Mori E, Ishikawa M, SINPHONI-2 Investigators: Lumboperitoneal shunt surgery for idiopathic normal pressure hydrocephalus (SINPHONI-2): an open-label randomised trial. Lancet Neurol 14: 585–594, 2015

There appears to be regional differences in the preferred mode of shunting in idiopathic normal pressure hydrocephalus (iNPH) patients. In Europe and North America, ventriculoperineal (VP) shunts are widely used, whereas in Japan, lumboperitoneal (LP) shunts are the preferred modality. The authors present a multicenter randomised control trial assessing LP shunts against conservative therapy in iNPH patients aged 60 to 85 years.

The main inclusion criteria were an iNPH diagnosis, presence of disproportionately enlarged subarachnoid space hydrocephalus (DESH) and a spine anatomy favourable for LP shunt insertion. Intention-to-treat assessment was performed on all participants prior to randomization into one of two cohorts: immediate shunt group, who had surgery within 1-month vs delayed shunt (control) group, who had surgery three months after randomization. Both cohorts concurrently underwent a series of physical exercises after their respective baselines were recorded. The immediate group began their exercises after their LP shunt surgery, while the delayed group completed 3 months of exercises prior to their LP shunt surgery. Both groups continued the exercises for 12 months postoperatively. The main primary and secondary endpoints were a one-point improvement on a modified Rankin scale (mRS) score at 3 months and 12 months after randomization.

Forty-six patients underwent immediate LP shunt surgery, while 42 patients were assigned to the delayed surgery cohort. At 3 months after randomization, 65% of the immediate group versus 5% of the delayed group had a favourable outcome. In addition, the immediate group significantly improved on almost all of the outcome assessments. At 12 months, there were no statistical difference in outcomes between the two groups. Overall, serious and non-serious adverse events occurred in 11%

and 28% respectively, all of which were related to the shunt malfunction or over-drainage.

Riva-Cambrin J, Kestle JRW, Holubkov R, Butler J, Kulkarni AV, Drake J, et al.: Risk factors for shunt malfunction in pediatric hydrocephalus: a multicenter prospective cohort study. J Neurosurg Pediatr: 1–9, 2015

In this article, authors of the Hydrocephalus Research Network (HCRN present a multi-center prospective cohort study that investigated the independent risk factors of CSF shunt failure in the pediatric population. Shunt failure was defined as shunt malfunction and or shunt infection.

Children less than 19 years of age undergoing their first shunt insertion for hydrocephalus were recruited at multiple centers between 2008 and 2011. The primary outcome was time to first shunt failure. The cohorts were dichotomized by age – those that had their first shunt insertion prior to 6 months of age and those older than 6 months.

Of 1036 enrolled children who were followed for a mean of 400 days, 33% experienced shunt failures, the vast majority of which (77%) were due to shunt malfunction. The mean time to shunt failure was 344 days. Of the eight risk factors analyzed which included age less than 6 months, HCRN site, shunt manufacturer, shunt programmability, cardiac comorbidity, use of endoscope and preoperative FOHR, the independent risk factors for shunt failures identified on a multivariate survival analysis included age less than 6 months, a cardiac comorbidity and use of endoscopic approach to shunt insertion.